FINAL SUBMITTAL

VOLUME III APPENDIX G, PART 2

FEASIBILITY STUDY FOR EXPANSION OF ENERGY MONITORING AND CONTROL SYSTEM (EMCS) FORT DRUM, NEW YORK

Prepared for

NORFOLK DISTRICT CORPS OF ENGINEERS, CENAO-EN-MC 803 FRONT STREET, NORFOLK, VIRGINIA 23510

Under

U.S. ARMY ENGINEER DISTRICT, MOBILE INDEFINITE DELIVERY A-E CONTRACT CONTRACT NO. DACA01-94-D-0033 DELIVERY ORDER NO. 0006

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By

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EXECUTIVE SUMMARY

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LIST OF ABBREVIATIONS

AC - air conditioning

ACC - anticipated contract cost

ACCU - air cooled condensing unit

ACM - asbestos containing material

ACU(s) - auxiliary control unit(s)

AHU - air handling unit

AI - analog input

AO - analog output

ASCII - American Standard Code for Information Interchange

ASHRAE - American Society of Heating, Refrigeration, and Air conditioning Engineers

B/C - benefit-to-cost ratio

BCD - binary coded decimal

BLDG - building

BEACON - Building Energy Simulation Program

Btu - British thermal units

Btuh - British thermal units per hour

B/W - black and white

C - Celsius

CCC - central communications controller

ccf - one hundred (100) cubic feet

CCU - central control unit

cf - cubic foot, cubic feet

cfm - cubic feet per minute

CLM - command line mnemonic

CLMI - command line mnemonic interpreter

COE - Corps of Engineers

COS - central operator station

CPU - central processing unit

CRT - cathode ray tube

CU(s) - control unit(s)

CWE - current working estimate

d - day(s)

DCP - duty cycle program

DEH - Directorate of Engineering and Housing

DHW - direct memory access

DI - digital input

DO - digital output

DOD - Department of Defense

DPW - Department of Public Works

DTM - data transmission media

DX - direct expansion

E/C - energy-to-cost ratio

ECIP - Energy Conservation Investment Program

ECO - energy conservation opportunity

EEAP - energy engineering analysis program

eff - efficiency

elec. - electricity

EMC - EMC Engineers, Inc.

EMCS - energy monitoring and control system

EMI - electromagnetic interference

ESCO - energy service company

EZ-DOE - Building Energy Simulation Program

F - Fahrenheit

FO - fiber optic(s)

ft - foot, feet

ft² - square feet

FY - fiscal year

gal - gallon(s)

hp - horsepower

hr - hours(s)

H & V - heating and ventilating

HVAC - heating, ventilation, and air conditioning

in. - inch(es)

I/O - input/output

kBtu - one thousand British thermal units

kcf - one thousand cubic feet

klb - one thousand pounds

kva - kilovolt - ampere

kW - kilowatt, one thousand watts

kWh - kilowatt-hour, one thousand watt-hours

1b - pound(s)

LCCA - life cycle cost analysis

LCCID - life cycle cost in design

LED - light emitting diode

LPG - liquefied petroleum gas

MAU - make-up air unit

MBtu - one million Btu

MCR - master control room

MHz - megahertz

Mh - man-hours(s)

mo - months(s)

MW - megawatt, one million watts

MWh - megawatt-hour, one million watt-hours

MZAHU - Multizone air handling unit

NA - Not active or Not applicable

NG - natural gas

NOAA - National Oceanic and Atmospheric Administration

no. - number

OA - outside air

O&M - operation and maintenance

PC - personal computer

PM - preventative maintenance

PROM - programmable read-only memory

psi(a)(g) - pounds per square inch (absolute) (gage)

RAM - random access memory

RCU(s) - remote control unit(s)

RTC - real-time clock

RTDOS/E - real-time disk operating system /executive

S&A - Supervision and Administration

scfm - sea-level cubic feet per minute

SES - shared energy savings

SIOH - supervision, inspection, and overhead

SIR - savings-to-investment ratio

SPW - single present worth

sq.ft. - square feet

st/sp - start/stop

stm - steam

SZAHU - single zone air handling unit

t - ton

temp - temperature

TRY - test reference year

UA - overall heat transfer coefficient (Btu/hr/ft²/°F)

UCU(s) - unitary control unit(s)

UH - unit heater

UMCS - utility monitoring and control system

UPW - uniform present worth

VAV - variable air volume

wk - week(s)

yr - year(s)

ENERGY CALCULATIONS

BUILDING 10200

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

11,248

10200

DATE: 09-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

- Jpious Zanding morniagon									
Category	Construction	Use	Occ.	Dav					
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT					

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	1230
CFM - CLG	0
% OA	100.00%
% Area	21.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	L
EFFHP 78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

09-Apr-95 PAGE 2 OF 2

Bldg Number:

10200

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

kW/yr	kWh/yr	MBtu/yr	MH/yr
	8,214.2	0.0	
0.0	287.5	0.0	
0.0	0.0	0.0	
0.0	0.0		
0.0	0.0		
0.0	8,501.7		
0.0	0.0		
0.0	0.0	0.0	
0.0	0.0		
0.0	0.0		
0.0	0.0		
0.0	0.0		
0.0	0.0	0.0	
	2 222 2 1	450.0	
	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 8,214.2 0.0 287.5 0.0	0.0 8,214.2 0.0 0.0 287.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 147.5 0.0 8,501.7 147.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 11.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10200

Building Sq.Ft.:

11,248

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU2

Typical Building Information									
Category		Construction	Use	Occ.	Day				
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	1
Load Factor	0.8
CFM - HTG	210
CFM - CLG	0
% OA	100.00%
% Area	4.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 69.20°	% 69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
. ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

PAGE 1 OF 2

09-Арг-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

09-Apr-95 PAGE 2 OF 2

Bldg Number:

10200

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	A CONTRACTOR OF THE STATE OF TH
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	28.1	
Sub Total	0.0	4,791.4	28.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.2	MA. 4.4.
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,791.4	30.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

11 248

10200

DATE: 10-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

11,248

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE1

Typical Building Information

	Typical Dallating information						
Category	Construction	Use	Occ.	Day			
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	Ó	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	. 0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

10-Apr-95 PAGE 2 OF 2

Bldg Number:

10200

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,328.6	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	•
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				·
Run Time, and Safety Alarms				3
TOTAL	0.0	5,328.6	1.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

11,248

10200

Building Sq.Ft.:

BLDG:

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

Typical Building Information

	Typical Danamy Internation								
ſ	Category		Construction	Use	Occ.	Day			
-		17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT			

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
F۷	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

DATE: 10-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

10-Apr-95 PAGE 2 OF 2

Bldg Number:

10200

System Type

12

System Name:

BASEBOARD RADIATION

System Number: HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	526.9	
Sub Total	0.0	2,397.8	526.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	40.9	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,397.8	568.6	3

ENERGY CALCULATIONS

BUILDING 10205

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10205

DATE: 31-Mar-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

18,546

System Type

11

System Name:

CONDENSING UNIT

System Number:

ACC1

Typical Building Information

Typical Danumg two transfers							
Category Construction		Use	Occ.	Day			
J -	11	BRICK	DENTAL CLINIC	700-1600	MON-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:	32	

Required Operation	S	M	Т	W	TH	F	8
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0
			-				

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		50
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		0.8
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS	REQUIRED	PRESENT
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HŘSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	4.34E-03	4.34E-03
COAUHC	1.67E-03	1.67E-03
HOAOH	232.16	232.16
HOAOHC	142.48	142.48
COAOC	8.51E-03	8.51E-03
COAOHC	3.26E-03	3.26E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	8.14E-04	8.14E-04
NSUCHO	5.00E-04	5.00E-04
DDCCHC	9.67E-05	9.67E-05
DDCCC	2.52E-04	2.52E-04
DSC	4.35E+03	4.35E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10205

System Type

11

System Name:

CONDENSING UNIT

System Number:

ACC1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,439.6	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	4.5	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	4.5	4,865.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	478.5	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	4.5	5,344.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

18,546

10205

Building Sq.Ft.: System Type

System Name:

VAV AHU

System Number:

AHU1

Typical Building Information

Typical building information								
Category	Construction	Use	Occ.	Day				
1	1 BRICK	DENTAL CLINIC	700-1600	MON-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	, d.,	INPUT
Motor HP		20.75
Load Factor		0.8
CFM - HTG		10430
CFM - CLG		17500
% OA		30.00%
% Area		13.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		0.8
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

F		11.474.17
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	4.34E-03	4.34E-03
COAUHC	1.67E-03	1.67E-03
HOAOH	232.16	232.16
HOAOHC	142.48	142.48
COAOC	8.51E-03	8.51E-03
COAOHC	3.26E-03	3.26E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	8.14E-04	8.14E-04
NSUCHC	5.00E-04	5.00E-04
DDCCHC	9.67E-05	9.67E-05
DDCCC	2.52E-04	2.52E-04
DSC	4.35E+03	4.35E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10205

System Type

System Name:

UHA VAV

System Number:

AHU1

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	116,476.7	0.0	
Optimum ST/SP	0.0	2,641.2	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	28.1	0.0	0.0	
Night Setback	0.0	0.0	130.4	
Sub Total	28.1	119,117.8	130.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	1,644.1	0.0	
DDC Control	0.0	16,102.0	10.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				6
TOTAL	28.1	136,863.9	140.9	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10205

Building Sq.Ft.: System Type

18,546 12

System Name:

BASEBOARD RADIATION

System Number:

Typical Building Information							
Category		Construction	Use	Occ.	Day		
	11	BRICK	DENTAL CLINIC	700-1600	MON-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	die	INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		87.00%
TON CAPC.		0
MBTU CAPC.		0.94283
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	4.34E-03	4.34E-03
COAUHC	1.67E-03	1.67E-03
HOAOH	232.16	232.16
НОАОНС	142.48	142.48
COAOC	8.51E-03	8.51E-03
COAOHC	3.26E-03	3.26E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		8.14E-04
NSUCHC		5.00E-04
DDCCHC		9.67E-05
DDCCC		2.52E-04
DSC		4.35E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR		9.57
OAR		7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

31-Mar-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10205

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HX1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,703.1	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	872.4	
Sub Total	0.0	2,865.2	872.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	70.2	
HW OA Reset	0.0	0.0	7.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,865.2	949.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

18,546

10205

Building Sq.Ft.:

System Type

System Name:

CONVERTER AND PUMPS

System Number: HX2

Typical Building Information

Typical Building Information							
Category	Construction	Use	Occ.	Day			
11	BRICK	DENTAL CLINIC	700-1600	MON-SAT			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.333333
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.3064
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

		16.150.155
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	4.34E-03	4.34E-03
COAUHC	1.67E-03	1.67E-03
НОАОН	232.16	232.16
НОАОНС	142.48	142.48
COAOC	8.51E-03	8.51E-03
COAOHC	3.26E-03	3.26E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	8.14E-04	8.14E-04
NSUCHC	5.00E-04	5.00E-04
DDCCHC	9.67E-05	9.67E-05
DDCCC	2.52E-04	2.52E-04
DSC	4.35E+03	4.35E+03
NSC	5.41E+04	5.41E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

31-Mar-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10205

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HX2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	959.3	0.0	<u> </u>
Optimum ST/SP	0.0	57.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	1,016.8	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,016.8	2.3	3

ENERGY CALCULATIONS

BUILDING 10207

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

18,199

10207

Building Sq.Ft.: System Type

System Name:

SINGLE ZONE AHU

System Number:

AHU1

Typical Building Information

Typical Building information								
Category		Construction	Use	Occ.	Day			
	12	BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

5	M	T	W	IH	۲	3
600	600	600	600	600	600	600
2100	2100	2100	2100	2100	2100	2100
		600 600	600 600 600	600 600 600 600	600 600 600 600 600	600 600 600 600 600

INPUTS	1.25		INPUT				
Moto	3.1						
Load F	Load Factor						
CFM -	HTG		2500				
CFM -	CLG		2500				
9	6 OA		35.00%				
%	% Area						
TON C	APC.		0				
MBTU C	APC.		0				
kV	V/Ton		0				
MC	SON		12				
	EFF		1				
LOOK-UP VALUE							
EF	FHP	79.00%	79.00%				

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	2,100
Heating HRSON	2,112	3,360
C/H HRSON	3,441	5,475
Cooling HRSAV	780	
Heating HRSAV	1,248	
C/H HRSAV	2,034	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
HOAOH	46.22	46.22
HOAOHC	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	2.98E-04	2.98E-04
ECHC	1.14E-04	1.14E-04
NSUCC	2.13E-03	2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+04	1.18E+04
NSC	3.21E+04	3.21E+04
FV	64	64
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

DATE:

PAGE 1 OF 2

31-Mar-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10207

System Type

System Name:

SINGLE ZONE AHU

System Number:

AHU1

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,403.0	0.0	
Optimum ST/SP	0.0	440.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	4.7	0.0	0.0	
Night Setback	0.0	0.0	87.5	
Sub Total	4.7	11,843.0	87.5	
Economizer	0.0	982.7	0.0	
Ventilation/Recirculation	0.0	614.2	10.7	
DDC Control	0.0	0.0	32.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	4.7	13,439.9	130.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10207

Building Sq.Ft.:

18,199

System Type

3

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

BLDG:

System Number:

AHU2

Typical Building Information

Typical Building information								
Category		Construction	Use	Occ.	Day			
	12	BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	600	600	600	600	600	600	600
Stop Time	1500	1500	1500	1500	1500	1500	1500

INPUTS	INPUT
Motor HP	7.5
Load Factor	0.8
CFM - HTG	4500
CFM - CLG	4500
% OA	35.00%
% Area	26.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 83.1	0% 83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	1,260
Heating HRSON	2,112	2,016
C/H HRSON	3,441	3,285
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
HOAOH	46.22	46.22
НОАОНС	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		2.98E-04
ECHC		1.14E-04
NSUCC		2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+04	1.18E+04
NSC	3.21E+04	3.21E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

31-Mar-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10207

System Type

;

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

AHU2

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	****
Duty Cycle	0.0	0.0	0.0	
Demand Limit	10.8	0.0	0.0	
Night Setback	0.0	0.0	151.7	
Sub Total	10.8	1,012.1	151.7	
Economizer	0.0	1,768.9	0.0	
Ventilation/Recirculation	0.0	1,105.5	0.0	
DDC Control	0.0	0.0	56.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	10.8	3,886.4	207.7	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

18,199

10207

Building Sq.Ft.:

System Type

3

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

BLDG:

System Number:

AHU3

Typical Building Information

Typical bunding information								
Category	Construction	Use	Occ.	Day				
1.	2 BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	w	TH	F	S
Start Time	600	600	600	600	600	600	600
Stop Time	2100	2100	2100	2100	2100	2100	2100

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		6100
CFM - CLG	i	6100
% OA		35.00%
% Area		36.00%
TON CAPC.		0
MBTU CAPC.	-	0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	2,100
Heating HRSON	2,112	3,360
C/H HRSON	3,441	5,475
Cooling HRSAV	780	
Heating HRSAV	1,248	
C/H HRSAV	2,034	

CONSTANT	LOOK-UP	INPUT
HOAUH		0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
HOAOH	46.22	46.22
НОАОНС	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	2.98E-04	2.98E-04
ECHC	1.14E-04	1.14E-04
NSUCC	2.13E-03	2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+04	1.18E+04
NSC	3.21E+04	3.21E+04
FV	64	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

PAGE 1 OF 2

31-Mar-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

31-Mar-95

PAGE 2 OF 2

Bidg Number:

10207

System Type

. .

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	27,156.9	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	10.8	0.0	0.0	
Night Setback	0.0	0.0	210.0	
Sub Total	10.8	28,169.0	210.0	
Economizer	0.0	2,397.8	0.0	
Ventilation/Recirculation	0.0	1,498.5	0.0	
DDC Control	0.0	0.0	77.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	10.8	32,065.4	287.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

18,199

10207

Building Sq.Ft.:

System Type

3

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

BLDG:

System Number:

AHU4

Typical Building Information

		. , , ,			,
ĺ	Category	Construction	Use	Occ.	Day
	12	BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	600	600	600	600	600	600	600
Stop Time	2100	2100	2100	2100	2100	2100	2100

INPUTS	INPUT
Motor HP	7.5
Load Factor	0.8
CFM - HTG	4000
CFM - CLG	4000
% OA	35.00%
% Area	23.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	2,100
Heating HRSON	2,112	3,360
C/H HRSON	3,441	5,475
Cooling HRSAV	780	
Heating HRSAV	1,248	
C/H HRSAV	2,034	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
НОАОН	46.22	46.22
HOAOHC	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	2.98E-04	2.98E-04
ECHC	1.14E-04	1.14E-04
NSUCC	2.13E-03	2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+04	1.18E+04
NSC	3.21E+04	3.21E+04
FV	64	64
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

DATE:

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10207

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	21,576.6	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	10.8	0.0	0.0	
Night Setback	0.0	0.0	134.2	
Sub Total	10.8	22,588.7	134.2	
Economizer	0.0	1,572.3	0.0	
Ventilation/Recirculation	0.0	982.6	17.1	
DDC Control	0.0	0.0	49.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	10.8	25,143.7	200.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10207

DATE: 31-Mar-95 PREPARED BY: CSW/BMG

EMC NO.: 1406-006

PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

18,199

System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

Typical Building Information

Typical Dallaring Information								
Category		Construction	Use	Occ.	Day			
	12	BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT	l		

20 32

Enter Weeks of Summer:
Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1600	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.8216
kW/Ton	0
MOSON	7
EFF	0.8
LOOK-UP VALUE	
EFFHP 78.00°	% 78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,540	3,360
Heating HRSON	2,464	5,376
C/H HRSON	4,015	8,760
Cooling HRSAV	1,820	
Heating HRSAV	2,912	
C/H HRSAV	4,745	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
HOAOH	46.22	46.22
HOAOHC	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	2.98E-04	2.98E-04
ECHC	1.14E-04	1.14E-04
NSUCC	2.13E-03	2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+04	1.18E+04
NSC	3.21E+04	3.21E+04
FV	64	64
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

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10207

Bldg Number: System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,453.7	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	4,741.3	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.6	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,741.3	7.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

18,199

10207

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

31-Mar-95

DATE:

PAGE 1 OF 2

BLDG:

Building Sq.Ft.:

System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

B2

Typical Building Information

Typical Ballating Internation								
Category	Category Construction		Use	Occ.	Day			
	12	BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1600	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.8216
kW/Ton	0
MOSON	7
EFF	0.8
LOOK-UP VALUE	
EFFHP 78	.00% 78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,540	3,360
Heating HRSON	2,464	5,376
C/H HRSON	4,015	8,760
Cooling HRSAV	1,820	
Heating HRSAV	2,912	
C/H HRSAV	4,745	

CT		Contraction of
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
HOAOH	46.22	46.22
HOAOHC	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	2.98E-04	2.98E-04
ECHC	1.14E-04	1.14E-04
NSUCC	2.13E-03	2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+04	1.18E+04
NSC	3.21E+04	3.21E+04
FV	64	64
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

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Bldg Number:

10207

System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

B2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,453.7	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	4,741.3	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.6	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,741.3	7.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

18,199

10207

BLDG:

Building Sq.Ft.: System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

B3

Typical Building Information

Typical Building Information							
Category		Construction	Use	Occ.	Day		
	12	BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1600	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.8216
kW/Ton	0
MOSON	7
EFF	0.8
LOOK-UP VALUE	
EFFHP 78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,540	3,360
Heating HRSON	2,464	5,376
C/H HRSON	4,015	8,760
Cooling HRSAV	1,820	
Heating HRSAV	2,912	
C/H HRSAV	4,745	

promise and the second second		
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
HOAOH	46.22	46.22
HOAOHC	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	2.98E-04	2.98E-04
ECHC	1.14E-04	1.14E-04
NSUCC	2.13E-03	2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+04	1.18E+04
NSC	3.21E+04	3.21E+04
FV	64	64
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

PAGE 1 OF 2

31-Mar-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

31-Mar-95

PAGE 2 OF 2

Bldg Number:

10207

System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

B3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,453.7	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	4,741.3	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.6	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,741.3	7.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

18,199

Building Sq.Ft.:

8

System Type System Name:

System Number:

WC1

10207

CHILLER AND PUMPS

Typical Building Information								
Category		Construction	Use	Occ.	Day			
	12	BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT			

Enter Weeks of Summer:

Enter Weeks of Winter:	•	32

Required Operation	3	IAI .	1	W	117		3
Start Time	700	700	700	700	700	700	700
Stop Time	1600	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	7.5
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	73
MBTU CAPC.	0
kW/Ton	0
MOSON	5
EFF	0.8
LOOK-UP VALUE	
EFFHP 83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,540	3,360
Heating HRSON	2,464	5,376
C/H HRSON	4,015	8,760
Cooling HRSAV	1,820	
Heating HRSAV	2,912	
C/H HRSAV	4,745	

	,	
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
HOAOH	46.22	46.22
HOAOHC	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	2.98E-04	2.98E-04
ECHC	1.14E-04	1.14E-04
NSUCC	2.13E-03	2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+04	1.18E+04
NSC	3.21E+04	3.21E+04
FV	64	64
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00
		188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

31-Mar-95

DATE:

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

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Bldg Number:

10207

System Type

System Name:

CHILLER AND PUMPS

System Number:

WC1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	9,797.8	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	10.8	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	10.8	10,809.9	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	698.6	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	10.8	11,508.5	0.0	

ENERGY CALCULATIONS

BUILDING 10210

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10210

Building Sq.Ft.:

12,448

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

	rypical Bullung information							
Γ	Category	Construction	Use		Occ.	Day		
T	17	BRICK	BN HQ BLDG		0600-1700	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

09-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

09-Apr-95 PAGE 2 OF 2

Bldg Number:

10210

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	163.3	
Sub Total	0.0	8,501.7	163.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,501.7	175.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10210

Building Sq.Ft.:

12,448

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU2

Typical Building Information

Typical bullating information									
Category		Construction	Use	Occ.	Day				
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT				

Enter Weeks of Summer:

20

32 **Enter Weeks of Winter:**

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG	0	
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC		4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

PAGE 1 OF 2

09-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

09-Apr-95 PAGE 2 OF 2

Bldg Number:

10210

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	,
Night Setback	0.0	0.0	31.1	- No. of the control
Sub Total	0.0	4,791.4	31.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		•		
Run Time, and Safety Alarms				3
TOTAL	0.0	4,791.4	33.5	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

12,448

10210

Building Sq.Ft.: System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE1

Typical Building Information

Typical Banding Information										
Category	Construction	Use	Occ.	Day						
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT						

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT			
Motor HP	2				
Load Factor	0.8				
CFM - HTG	CFM - HTG				
CFM - CLG		0			
% OA		0.00%			
% Area		0.00%			
TON CAPC.		0			
MBTU CAPC.		0.2602			
kW/Ton		0			
MOSON		7			
EFF		1			
LOOK-UP VALUE					
EFFHP	78.00%	78.00%			

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

LOOK UP	INPUT
LOOK-UP	INPUI
0.00	0.00
0.00	0.00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
257.00	257.00
158.00	158.00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00	0.00
0.17	0.17
0.00E+00	0.00E+00
4.84E+03	4.84E+03
6.25E+04	6.25E+04
0	0
9.57	9.57
7.40	7.40
188.00	188.00
	0.00 0.00E+00 0.00E+00 158.00 0.00E+00 0.00E+00 0.017 0.00E+00 7.40

EMC NO.: 1406-006

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PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

04-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10210

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,328.6	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,328.6	1.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10210

DATE: 04-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

12,448

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

Typical Building Information

	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT				
Motor HP	0.75					
Load Factor	Load Factor					
CFM - HTG		0				
CFM - CLG		0				
% OA		0.00%				
% Area		75.00%				
TON CAPC.		0				
MBTU CAPC.		0.1117				
kW/Ton		0				
MOSON		7				
EFF		1				
LOOK-UP VALUE						
EFFHP	65.00%	65.00%				

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10210

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	583.2	
Sub Total	0.0	2,397.8	583.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,397.8	629.2	3

ENERGY CALCULATIONS

BUILDING 10212

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10,212

Building Sq.Ft.:

51,794

System Type

CONVERTER AND PUMPS

System Name: System Number:

HE-1

Typical Building Information							
Category Construction Use Occ. Day							
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.5123
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	The Application of the Control of the
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

01-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10,212

9

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	3.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	3.8	3.**

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10,212

EMC NO.: 1406-006 DATE:

01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

51,794

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

Typical Building Information

Typica: wanting						
Category	Construction	Use	Occ.	Day		
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT				
Motor HP	Motor HP					
Load Factor		0.8				
CFM - HTG		0				
CFM - CLG		0				
% OA		0.00%				
% Area		0.00%				
TON CAPC.		0				
MBTU CAPC.		0.9801				
kW/Ton		0				
MOSON		7				
EFF		1				
LOOK-UP VALUE						
EFFHP	65.00%	65.00%				

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC		5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number: System Type

10,212

System Name:

12 **BASEBOARD RADIATION**

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.3	
Chilled Water Reset	0.0	0.0	0.0	,,,,,,
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	7.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10212

01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

17,610

System Type

14

System Name:

VENTILATION

System Number:

AHU1

Typical Building Information

Typiout Duning with the control of t						
Category	Construction	Use	Occ.	Day		
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4566
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS	REQUIRED HR/YR	
CALCULATIONS	nk/ik	HRITK
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bidg Number:

10212

System Type

14 VENTILATION

System Name: System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10212

EMC NO.: 1406-006

DATE: 01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

17,610 14

System Type System Name:

VENTILATION

System Number:

AHU2

Typical Building Information

.,,						
Categ	jory	Construction	Use	Occ.	Day	
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI	

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.	1	0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV		0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10212

System Type

14 VENTILATION

System Name: System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5.092.0	0.0	45 Diameter 30

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10212

12-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

17,610

System Type System Name:

14 **VENTILATION**

System Number:

AHU-3

Typical Building Information

.) [
Category Construction		Use	Occ.	Day					
1	4 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI					

Enter Weeks of Summer:

20

32 **Enter Weeks of Winter:**

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	3	
Load Factor		0.8
CFM - HTG	4566	
CFM - CLG	0	
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number:

10212

System Type

14

System Name: System Number: VENTILATION AHU-3

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

BLDG:

10212

01-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

LOCATION: FT. DRUM

Building Sq.Ft.: System Type

14

System Name:

VENTILATION

AHU4

System Number:

Typical Building Information

Typical ballottig information								
Category		Construction	Use	Occ.	Day			
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	.	S	М	Т	W	TH	F	S
Start Time	:	0	600	600	600	600	600	0
Stop Time		0	1700	1700	1700	1700	1700	0

Present Operations	-	S	M	T	W	TH	F	S
Start Time	:	0	0	0	0	0	0	0
Stop Time	1	2400	2400	2400	2400	2400	2400	2400

INPUTS	1 1 1 1 1 1	INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4566
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS	REQUIRED	PRESENT
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10212

System Type

14

System Name:

VENTILATION

System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10212

02-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

17,610

Building Sq.Ft.: System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

Typical Building Information

Typical Danamy mornization						
Category	Construction	Use	Occ.	Day		
	4 BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	750
CFM - CLG	0
% OA	100.00%
% Area	12.75%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	[167] J. M. Steller, Phys. Lett. B 199, 199
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10212

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	122.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10212

DATE:

02-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

17,610

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU7

Typical Building Information

Typical Danding Information								
Category		Construction	Use	Occ.	Day			
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700		1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	J. 40.5-1.		INPUT
Moto	r HP		0.33
Load F	actor		0.8
CFM -	HTG		750
CFM -	CLG		0
9	6 OA		100.00%
%	Area		12.75%
TON C	APC.		0
MBTU C	APC.		0
kV	V/Ton		0
MC	SON		12
	EFF		1
LOOK-UP VALUE			
EF	FHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10212

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	,
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL AND	0.0	1,683.3	122.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY** BLDG:

LOCATION: FT. DRUM

10212

DATE: 02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

System Type

17,610 1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

8UHA

Typical Building Information

Typical Dunanig Information								
Category		Construction	Use	Occ.	Day			
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	Taylor.		INPUT
Motor	HP		0.33
Load Fa	ctor		0.8
CFM - H	TG		750
CFM - C	LG		0
%	OA		100.00%
% A	rea		12.75%
TON CA	PC.		0
MBTU CA	PC.		0
kW/	Ton		0
MOS	SON		12
E	FF		1
LOOK-UP VALUE			
EFF	HP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10212

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

8UHA

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	122.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10212

DATE: 02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

17,610

17,010

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: AHU9

Typical Building Information

Typical Danaling Information									
Category Construction		Use	Occ.	Day					
	14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0_	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	750
CFM - CLG	0
% OA	100.00%
% Area	12.75%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10212

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		·		
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	122.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10212

Building Sq.Ft.: System Type

34,184

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: AHU10

Typical Building Information

Typical Building Information									
Category	Category Construction		Use	Occ.	Day				
	15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.5
Load Factor		0.8
CFM - HTG		1860
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF	1	
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	I OOK-LIP	INPUT
HOAUH		0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
HOAOHC	0.00	0.00
COAOC		0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

02-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10212

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	79.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	79.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10212

Building Sq.Ft.:

34,184

2400

System Type System Name:

System Number:

H&V UNIT WITHOUT RETURN FAN

AHU11

Typical Building Information

		i y pioui =	dilaning time intation.		
Category		Construction	Use	Occ.	Day
3.,	15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Stop Time

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0_	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1350
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
НОАОНС	0.00	0.00
COAOC		0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHO		0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC		1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR		9.57
OAR		7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

02-Apr-95

DATE:

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10212

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	79.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	79.9	atinto jour as a 3

ENERGY CALCULATIONS

BUILDING 10214

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10214

01-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

48,916

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE-1

Typical Building Information

Typical building information								
Category		Construction	Use	Occ.	Day			
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	w	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.3875
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number: System Type

10214

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	****
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		·		
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	2.9	3 (A. 3)

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10,214

DATE:

01-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

48,916

12

System Type System Name:

BASEBOARD RADIATION

System Number:

HE-2

Typical Building Information

Typical Ballang Information						
Category		Construction	Use	Occ.	Day_	
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI	

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.6683
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,214

System Type

System Name:

BASEBOARD RADIATION

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	.
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms		3		
TOTAL	0.0	0.0	4.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10214

02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

12,240

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

AHU1

Typical Building Information

Typical Daniellig Internation						
Category		Construction	Use	Occ.	Day	
	14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI	

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10214

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	101.2	
Sub Total	0.0	1,683.3	101.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0,0	1,683.3	113.4	(1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997)

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10214

Building Sq.Ft.: System Type

12,240

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU2

Typical Building Information

Typical Building Information						
Category	Construction	Use	Occ.	Day		
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

02-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10214

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	•
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	101.2	
Sub Total	0.0	1,683.3	101.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	113.4	wiiniDignooliyoo oo ahaan 3 ah

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

12,240

10214

DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

0

600

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

12,270

System Type

Start Time

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

AHU4

Typical Building Information

. , p. o z						
Category	Construction	Use	Occ.	Day		
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

600

Required Operation	S	М	Т	W	TH

Stop Time	0	1700	1700	1700	1700	1700	0
				•			

600

600

600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	101.2	
Sub Total	0.0	1,683.3	101.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset *	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	113.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10214

DATE: 01-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU5

Typical Building Information

.,,						
Category	Construction	Use	Occ.	Day		
	5 BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT		

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	AND AND ADDRESS OF THE ADDRESS OF TH
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10214

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr			
Schedule ST/SP	0.0	0.0	0.0				
Optimum ST/SP	0.0	0.0	0.0				
Duty Cycle	0.0	0.0	0.0				
Demand Limit	0.0	0.0	0.0				
Night Setback	0.0	0.0	0.0				
Sub Total	0.0	0.0	0.0				
Economizer	0.0	0.0	0.0				
Ventilation/Recirculation	0.0	0.0	0.0				
DDC Control	0.0	0.0	87.5				
HW OA Reset	0.0	0.0	0.0				
Chilled Water Reset	0.0	0.0	0.0				
Condenser Water Reset	0.0	0.0	0.0				
Chiller Demand Limit	0.0	0.0	0.0				
Remote Monitoring, Maintenance,							
Run Time, and Safety Alarms	3						
TOTAL	0.0	0.0	87.5	3			

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG

10214

BLDG: 102

Building Sq.Ft.:

36,712

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

Typical Building Information

Typical Building Information						
Category	Construction	Use	Occ.	Day		
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT		

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	.Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1060
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
НОАОНС	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

DATE: 01-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10214

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	87.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	•
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	0.0	87.5	

ENERGY CALCULATIONS

BUILDING 10220

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10220

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

05-Apr-95

DATE:

PAGE 1 OF 2

Building Sq.Ft.: System Type

12,448

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

	Typical Bulluling information						
Г	Category		Construction	Use	Occ.	Day	
		17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT	

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Stop Time

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HŘSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10220

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	163.3	
Sub Total	0.0	8,501.7	163.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	10.00
DDC Control	0.0	0.0	12.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,501.7	175.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10220

DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

12,448

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

AHU-2

Typical Building Information

Typical building information							
Category	Construction	Use	Occ.	Day			
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	.,,
Heating HRSAV	3,296	
C/H HŘSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10220

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	The second secon
Night Setback	0.0	0.0	31.1	
Sub Total	0.0	4,791.4	31.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,791.4	33.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10220

DATE: 04-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

12,448

System Type

System Name:

CONVERTER AND PUMPS

HE1 System Number:

Typical Building Information

	. , , , , , ,	3		
Category	Construction	Use	Occ.	Day
	7 BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
НОАОНС	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10220

System Type

....

System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	<u>-</u>
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,328.6	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,328.6	1.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10220

DATE: 04-Apr-95 PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

12,448

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

Typical Building Information

Typiou. Duning months								
Category		Construction	Use	Occ.	Day			
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10220

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	<u>-</u>
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	583.2	
Sub Total	0.0	2,397.8	583.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	, A.A
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,397.8	629.2	3 P

ENERGY CALCULATIONS

BUILDING 10222

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10222

01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

51,794

System Type

CONVERTER AND PUMPS

System Name: System Number:

HE-1

Typical Building Information							
Category		Construction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	s	M	Т	w	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.3875
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS		PRESENT HR/YR
Cooling HRSON	1,900	3,360
Heating HRSON	3,040	5,376
C/H HRSON	4,954	8,760
Cooling HRSAV	1,460	
Heating HRSAV	2,336	
C/H HRSAV	3,806	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC		5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR		9.57
OAR		7.40
OPT	188.00	188.00

^{*}ESTIMATED PUMP ON 50% OF UNOCCUPIED HOURS

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10222

9

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,572.8	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	3,860.3	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms			ļ	3
TOTAL	0.0	3,860.3	2.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

HE-2

LOCATION: FT. DRUM

BLDG:

10,222

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

01-Apr-95

DATE:

PAGE 1 OF 2

Building Sq.Ft.:

51,794

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

Typical Building Information

Typical Building Information							
Category		Construction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	М	Τ	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.9801
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH		0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10,222

12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	MAX.
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	4.0.
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	7.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10222

EMC NO.: 1406-006

DATE: 01-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

17,610

System Type

14

System Name:

VENTILATION

System Number:

AHU1

Typical Building Information

	rypical building information							
Category Construction		Use	Occ.	Day				
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4566
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	. 7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10222

System Type System Name:

VENTILATION

System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10222

EMC NO.: 1406-006

DATE: 12-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

17,610

System Type

14

System Name:

VENTILATION

System Number:

AHU-2

Typical Building Information

Typical Danumg intermedia							
Category	Construction	Use	Occ.	Day			
14	BRICK	ADM & SUPPLY, ENL BRK V	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	3
Load Factor	0.8
CFM - HTG	0
CFM - CLG	4779
% OA	100.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	5
EFF	1
LOOK-UP VALUE	
EFFHP 79.00	% 79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO		0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number:

10222

System Type

14

System Name: System Number: **VENTILATION** AHU-2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				(
TOTAL	0.0	5.092.0	0.0	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10222

EMC NO.: 1406-006

DATE: 01-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

17,610 14

VENTILATION

System Name: System Number:

System Type

AHU3

Typical Building Information

Typical building information							
Category	Construction	Use	Occ.	Day			
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	T	W	TH	F	<u> </u>
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR		9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bidg Number:

10222

System Type

14 VENTILATION

System Name: System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0 i	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	**************************************
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms			İ	3
TOTAL	0.0	5,092.0	0.0	1 NOTE 3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10222

DATE: 01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type

17,610 14 **VENTILATION**

System Name: System Number:

AHU4

Typical Building Information

	Typical Bullating Information						
Category		Construction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	r vergledert in	INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4566
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	. 7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95

PAGE 2 OF 2

Bldg Number:

10222

System Type

14

System Name:

VENTILATION

System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	***************************************
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10222

02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

17,610

Building Sq.Ft.: System Type

AHU6

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

Typical Building Information

	Typical Building Information							
Category		Construction	Use	Occ.	Day			
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	750
CFM - CLG	0
% OA	100.00%
% Area	12.75%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 6	5.00% 65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95

PAGE 2 OF 2

Bldg Number:

10222

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	122.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10222

DATE:

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

02-Apr-95

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

17,610

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: AHU7

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10222

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	122.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

17,610

10222

02-Арг-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU8

Typical Building Information

	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
	Category	Construction	Use	Occ.	Day			
į	14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10222

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

8UHA

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	~
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	122.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10222

Building Sq.Ft.:

17,610

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU9

Typical Building Information

	. , p.ou	- anamy		
Category	Construction	Use	Occ.	Day
	4 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI

20 2

Enter weeks of Summer:	
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area	12.75%	
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON	12	
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	. 0	0
CHWR	9.57	9.57
OAR		7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

02-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10222

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	122.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

Building Sq.Ft.:

34,184

10222

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU10

Typical Building Information

Typiour Dunaning information							
Category	Construct	tion Use	Occ.	Day			
,	15 BRICK	ADM & SUPPLY, ENL BR	0000-2400	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.5
Load Factor	0.8
CFM - HTG	1860
CFM - CLG	0
% OA	100.00%
% Area	26.70%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS		PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
НОАОНС	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
· ECC		0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

DATE:

PAGE 1 OF 2

02-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10222

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	79.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		Total Park		
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	79.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10222

Building Sq.Ft.: System Type 34,184

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU11

Typical Building Information

Typical Dallang Information						
Cate	egory	Construction	Use	Occ.	Day	
	15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT	

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT			
Motor HP					
Load Factor		0.8			
CFM - HTG		1350			
CFM - CLG		0			
% OA		100.00%			
% Area		19.30%			
TON CAPC.		0			
MBTU CAPC.		0			
kW/Ton		0			
MOSON		12			
EFF		1			
LOOK-UP VALUE					
EFFHP	65.00%	65.00%			

HOURS CALCULATIONS	REQUIRE HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC		0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

02-Apr-95

DATE:

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number: System Type

10222

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	79.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	0.0	79.9	

ENERGY CALCULATIONS

BUILDING 10224

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10224

14-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

48,961

System Type

9

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

Typical Building Information

		i y pivai =			
Category Construction		Use	Occ.	Day	
		BRICK	ADM & SUPPLY, ENL BRK	600-1700	MON-FRI

Enter Weeks of Summer:

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	8.0
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.3875
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 78.0	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	14.77
HOAOHC	110.07	9.07
COAOC	0.00E+00	2.10E-05
COAOHC	0.00E+00	8.04E-06
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	1.26E-05
NSUCHO	0.00E+00	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	8.71E+03
NSC	4.86E+04	5.97E+04
FV	0	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

14-Apr-95 PAGE 2 OF 2

Bldg Number:

10224

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	2.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10,224

Building Sq.Ft.: System Type

48,916

12

2400

System Name:

BASEBOARD RADIATION

System Number:

HE-2

Typical Building Information

Typical bullding information						
Category		Construction	Use	Occ.	Day	
- Juliago ,	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI	

Enter Weeks of Summer:

20 32

2400

Enter Weeks of Winter:

Stop Time

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	. 0	0

2400

2400

2400

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.75
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.6683
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	Ì

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

2400

2400

DATE:

PAGE 1 OF 2

01-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,224

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	, TESTIVA . **
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	4.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10224

Building Sq.Ft.:

12,240

System Type

System Name: System Number: **H&V UNIT WITHOUT RETURN FAN**

AHU1

Typical Building Information

Typiour Dunanig Internation						
Category		Construction	Use	Occ.	Day	
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI	

Enter Weeks of Summer:

20

En

1.0. 1.00112 01 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
nter Weeks of Winter:	32
	•

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

	· · · · · · · · · · · · · · · · · · ·	
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

02-Apr-95

DATE:

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95

PAGE 2 OF 2

Bldg Number: System Type 10224

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	101.2	
Sub Total	0.0	1,683.3	101.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	113.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY BLDG:

LOCATION: FT. DRUM

12,240

10224

Building Sq.Ft.:

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU2

Typical Building Information

Typical Building Information						
Category		Construction	Use	Occ.	Day	
Category	14		ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI	
1	17	D. (101)				

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	Т	w	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

02-Apr-95

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10224

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	101.2	
Sub Total	0.0	1,683.3	101.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0		
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,	0.0	0.0	0.0	
Run Time, and Safety Alarms				2
TOTAL	0.0	1,683.3	113.4	3 3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10224

DATE: 02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: CSW/BMC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

12,240

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU4

Typical Building Information

Typical Ballating Miletination								
Category Construction		Use	Occ.	Day				
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG	770	
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

	REQUIRED	
CALCULATIONS	HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10224

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	101.2	
Sub Total	0.0	1,683.3	101.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				_
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	113.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

36.712

10224

Building Sq.Ft.:

<u> 36,712</u>

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU5

Typical Building Information

Typical Building Information								
Category		Construction	Use	Occ.	Day			
	15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:	32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400
Otop Tille		L	L				

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	1300
CFM - CLG	0
% OA	100.00%
% Area	16.70%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	M. 1977 MARCHA E. 1997 A. 1997 April 1997
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

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01-Арг-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10224

System Type

0224

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	87.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	0.0	87.5	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

36,712

Building Sq.Ft.:

System Type

System Name:

System Number:

AHU6

10224

H&V UNIT WITHOUT RETURN FAN

Typical Building Information

Construction Use Occ. Day Category ADM & SUPPLY, ENL BRK 0000-2400 SUN-SAT BRICK 15

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1060
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC		0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

PAGE 1 OF 2

01-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date: 02-Apr-95 PAGE 2 OF 2

Bldg Number:

10224

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	87.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	0.0	87.5	

ENERGY CALCULATIONS

BUILDING 10230

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10230

DATE: 09-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

12,448

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: AHU1

Typical Building Information

Typical Building Information						
Category	Construction	Use	Occ.	Day		
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT		

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00
<u> </u>		

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

09-Apr-95 PAGE 2 OF 2

Bldg Number:

10230

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	163.3	
Sub Total	0.0	8,501.7	163.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,501.7	175.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10230

EMC NO.: 1406-006

09-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

12,448

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU2

Typical Building Information

Typical Danding information									
Category		Construction	Use	Occ.	Day				
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT				

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	1
Load Factor	0.8
CFM - HTG	210
CFM - CLG	0
% OA	100.00%
% Area	4.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

09-Apr-95 PAGE 2 OF 2

Bldg Number:

10230

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	7 = //L
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	- H.
Night Setback	0.0	0.0	31.1	
Sub Total	0.0	4,791.4	31.1	
Economizer	0.0	0.0	0.0	* *************************************
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,791.4	33.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10230

DATE: 04-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

12,448

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE1

Typical Building Information

. 7								
Category	Construction	Use	Occ.	Day				
	17 BRICK	BN HQ BLDG	0600-1700	SUN-SAT				

20 32

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	Т	W	TH	F	S
Start Time		0 600	600	600	600	600	0
Stop Time		0 1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	. 7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10230

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,328.6	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,328.6	1.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY** BLDG:

HE2

LOCATION: FT. DRUM

10230

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

04-Apr-95

DATE:

PAGE 1 OF 2

Building Sq.Ft.:

12,448

System Type

System Name:

BASEBOARD RADIATION

System Number:

Typical Building Information						
Category	Construction	Use	Occ.	Day		
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT		

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	100,000,000	INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	•

CONSTANT	LOOK-UP	INPUT
HOAUH		0.00
HOAUHC	0.00	0.00
COAUC		0.00E+00
COAUHC		0.00E+00
НОАОН	257.00	257.00
HOAOHC	158.00	158.00
COAOC		0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR		9.57
OAR		7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10230

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	583.2	
Sub Total	0.0	2,397.8	583.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	, , , , , , , , , , , , , , , , , , , ,
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,397.8	629.2	3

ENERGY CALCULATIONS

BUILDING 10232

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10,232

-

DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

51,794

System Type

System Name:

CONVERTER AND PUMPS

System Number: HE-1

Typical Building Information

. , , , , , , , , , , , , , , , , , , ,						
Category	Construction	Use	Occ.	Day		
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	М	Т	w	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.5123
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,232

System Type

•

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	3.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	3.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10,232

DATE:

01-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

51,794

System Type

12

System Name: System Number: **BASEBOARD RADIATION**

HE-2

Typical Building Information

Typical Bulluting Information						
Category	Construction	Use	Occ.	Day		
	14 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.75
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.9801
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 65	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
 COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
 OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10,232

12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	7.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10232

EMC NO.: 1406-006

CHECKED BY: KC/WLC

DATE: 12-Apr-95 PREPARED BY: CSW/BMG

PAGE 1 OF 2

Building Sq.Ft.:

17,610

System Type

14

System Name:

VENTILATION

System Number:

AHU-1

Typical Building Information

. ypioui seriang in a managarang in a managara								
Category	Construction	Use	Occ.	Day				
14	BRICK	ADM & SUPPLY,ENL BRK V	0600-1700	MON-FRI				

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND		0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number:

10232

System Type

14

System Name:

VENTILATION

System Number:

AHU-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10232

01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

17,610 14

System Type

VENTILATION

System Name: System Number:

AHU2

Typical Building Information

Category	10	Construction	Use	1	Occ.	Day
	14	BRICK	ADM & SUPPLY.ENL BRK	ı	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S		M	T	w	TH	F	S
Start Time		0 ;	600	600	600	600	600	0
Stop Time		0:	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF	1	1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS	REQUIRED PRESENT				
CALCULATIONS	HR/YR	HR/YR			
Cooling HRSON	1,300	3,360			
Heating HRSON	2,080	5,376			
C/H HRSON	3,389	8,760			
Cooling HRSAV	2,060				
Heating HRSAV	3.296				
C/H HRSAV	5,371				

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10232

System Type

14 VENTILATION

System Name: System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10232

12-Apr-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

17,610

Building Sq.Ft.: System Type

14

System Name:

VENTILATION

System Number:

AHU3

Typical Building Information

Typical Bulluling Information								
Category	Category		Construction Use		Day			
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT					
Motor HP	3						
Load Factor	Load Factor						
CFM - HTG		0					
CFM - CLG	CFM - CLG						
% OA	% OA						
% Area		0.00%					
TON CAPC.		0					
MBTU CAPC.		0					
kW/Ton		0					
MOSON		5					
EFF		1					
LOOK-UP VALUE							
EFFHP	79.00%	79.00%					

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number: System Type

10232

System Name:

14 **VENTILATION**

System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10232

12-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

17,610

System Type

14 **VENTILATION**

System Name: System Number:

AHU-4

Typical Building Information

	Typical Saliening Information								
ĺ	Category Construction		Use	Occ.	Day				
ł	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	3
Load Factor	0.8
CFM - HTG	4779
CFM - CLG	0
% OA	100.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	5
EFF	1
LOOK-UP VALUE	
EFFHP 79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number: System Type

10232 14

System Name:

VENTILATION

System Number:

AHU-4

kW/yr	kWh/yr	MBtu/yr	MH/yr
0.0	4,666.1	0.0	
0.0	425.8	0.0	
0.0	0.0	0.0	
0.0	0.0	0.0	•
0.0	0.0	0.0	
0.0	5,092.0	0.0	
0.0	0.0	0.0	
0.0	0.0	0.0	
0.0	0.0	0.0	
0.0	0.0	0.0	
0.0	0.0	0.0	
0.0	0.0	0.0	
0.0	0.0	0.0	
			0
	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 4,666.1 0.0 425.8 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 5,092.0 0.0	0.0 4,666.1 0.0 0.0 425.8 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 5,092.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10232

DATE: 02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

17,610

Building Sq.Ft.: System Type

AHU6

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

Typical Building Information

Typical Bullang Information						
Category		Construction	Use	Occ.	Day	
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI	

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	H	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10232

System Type System Name: 1 H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		***************************************		
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	122.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10232

DATE:

02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

17,610

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU7

Typical Building Information

	· , p			
Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA	100.00%	
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	1 4 APP 1 APP 1 APP 1 APP 1
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number: System Type

10232

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
A COTAL OF THE STATE	0.0	1,683.3	122.3	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10232

EMC NO.: 1406-006

02-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

17,610

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

8UHA

Typical Building Information

Typical Bullang mornacion								
Category	Construction	Use	Occ.	Day				
1	4 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI				

20 32

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	0.33	
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA	100.00%	
% Area	12.75%	
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10232

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

8UHA

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	7
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	, ,
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	122.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10232

DATE:

02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

17,610

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU9

Typical Building Information

Typiour During								
Category Construction		Use	Occ.	Day				
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	0.33	
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA	100.00%	
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.Q0E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10232

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	٠ 0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	122.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

.

10232

DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

34,184

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: AHU10

Typical Building Information

		1		
Category	Construction	Use	Occ.	Day
	15 BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.5
Load Factor	0.8
CFM - HTG	1860
CFM - CLG	0
% OA	100.00%
% Area	19.30%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
НОАОНС	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10232

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	80.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	80.0	n suger tradition region in 3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10232

02-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

34,184

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU11

Typical Building Information

	. , p.ou. =	449		
Category	Construction	Use	Occ.	Day
1:	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	1350
CFM - CLG	0
% OA	100.00%
% Area	19.30%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10132

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	·
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	77.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	0.0	77.5	As a later of

ENERGY CALCULATIONS

BUILDING 10234

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10,234

Building Sq.Ft.: System Type

57,581

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

Typical Building Information

Typical Danaing internation								
Category Construction		Use	Occ.	Day				
1	4 BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.5123
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	_0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

PAGE 1 OF 2

01-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,234

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	3.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	3.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10,234

01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

57,581

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

Typical Building Information

Typical Bullang Intermedia								
Category Con		Construction	Use	Occ.	Day			
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

2

Enter weeks of Summer.	
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	Maria Arte	INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.9801
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10,234 12

System Name:

BASEBOARD RADIATION

System Number: HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms	,			3
TOTAL	0.0	0.0	7.3	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG: 19,578

10234

EMC NO.: 1406-006 DATE: 12-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type System Name:

14 **VENTILATION**

System Number:

AHU-1

Typical Building Information

	. , , , , , , , , , , , , , , , , , , ,								
Category Construction		Use	Occ.	Day					
	14	BRICK	ADM & SUPPLY,ENL BRK V	0600-1700	MON-FRI				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	3
Load Factor	0.8
CFM - HTG	0
CFM - CLG	4779
% OA	100.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	5
EFF	1
LOOK-UP VALUE	
EFFHP 79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10234

System Name:

14 VENTILATION

System Number:

AHU-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10234

EMC NO.: 1406-006

DATE: 12-Apr-95

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type

19,578 14

System Name:

VENTILATION

System Number:

AHU-2

Typical Building Information

	Typiout Daniel Grant Control of the							
į	Category	Construction	Use	Occ.	Day	ĺ		
	14	BRICK	ADM & SUPPLY,ENL BRK V	0600-1700	MON-FRI	ĺ		

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS			INPUT	
Mot	Motor HP			
Load	Factor		0.8	
CFM -	HTG		0	
CFM -	CLG		4779	
	% OA		100.00%	
%	Area		0.00%	
TON C	APC.		0	
MBTU (CAPC.		0	
k\	W/Ton		0	
M	OSON		5	
	EFF		1	
LOOK-UP VALUI	=			
	FFHP	79.00%	79.00%	

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10234

12-Apr-95 PAGE 2 OF 2

Date:

Bldg Number: System Type

System Name:

14 **VENTILATION**

System Number:

AHU-2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10234

EMC NO.: 1406-006

DATE: 01-Apr-95
PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

19,578

System Type

14

System Name:

VENTILATION

System Number:

AHU3

Typical Building Information

	Typical Saliding information							
Category		Construction	Use	Occ.	Day			
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	3
Load Factor	0.8
CFM - HTG	0
CFM - CLG	4779
% OA	100.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	5
EFF	1
LOOK-UP VALUE	
EFFHP 79.00%	6 79.00%

HOURS CALCULATIONS	REQUIRED PRESE HR/YR HR/Y		
Cooling HRSON	1,300	3,360	
Heating HRSON	2,080	5,376	
C/H HRSON	3,389	8,760	
Cooling HRSAV	2,060		
Heating HRSAV	3,296		
C/H HRSAV	5,371		

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10234

System Type

14 VENTILATION

System Name: System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3:

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10234

DATE:

12-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

19,578

System Type

14

System Name:

VENTILATION

System Number:

AHU-4

Typical Building Information

Typical Bullating Internation								
Category		Construction	Use	Occ.	Day			
	14	BRICK	ADM & SUPPLY ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		4779
CFM - CLG		0
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	and the second second second second
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number:

10234

System Type

14

System Name:

VENTILATION

System Number:

AHU-4

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10234

DATE: 02-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

19,578

AHU6

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

Typical Building Information

Category	Occ.	Dav		
Category	Construction	Use	-	
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

leading 600 in the first rate of any day in accordance to the	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
· ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR		9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10234

System Type

1 H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	121.4	
Sub Total	0.0	1,683.3	121.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	14.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	**************************************
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	136.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10234

Building Sq.Ft.:

19,578

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU7

Typical Building Information

Typical building information							
Category	Construction	Use	Occ.	Day			
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS			INPUT
Mot	or HP		0.33
Load	Factor		0.8
CFM -	HTG		750
CFM ·	- CLG		0
	% OA		100.00%
%	Area		12.75%
TON C	APC.		0
MBTU	CAPC.		0
k'	W/Ton		0
M	OSON		12
	EFF		1
LOOK-UP VALU	E		
E	FFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	. 7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

02-Apr-95

DATE:

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10234

System Type

.....

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	121.4	
Sub Total	0.0	1,683.3	121.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	14.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	136.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10234

DATE:

02-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

19,578

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

8UHA

Typical Building Information

	Typical Bullanding Internation								
Category Construction		Use	Occ.	Day					
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	750
CFM - CLG	0
% OA	100.00%
% Area	12.75%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10234

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	121.4	
Sub Total	0.0	1,683.3	121.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	14.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	136.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10234

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

DATE:

EMC NO.: 1406-006

02-Apr-95

PAGE 1 OF 2

Building Sq.Ft.:

19,578

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU9

Typical Building Information

	Typical Building Information						
Category		Construction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Τ .	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10234

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	121.4	
Sub Total	0.0	1,683.3	121.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	14.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	136.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10234

Building Sq.Ft.:

38,003

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU10

Typical Building Information

	Typical Building information						
Category	Construction	Use	Occ.	Day			
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.5
Load Factor		0.8
CFM - HTG		1860
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

DATE:

PAGE 1 OF 2

02-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10234

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	•
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	88.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	0.0	88.9	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10234

Building Sq.Ft.: System Type

38,003

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU11

Typical Building Information						
Category	Co	nstruction	Use	Occ.	Day	
	5	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT	l

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	1350
CFM - CLG	0
% OA	100.00%
% Area	19.30%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
HOAUH		0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

02-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10234

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	88.9	
HW OA Reset	0.0	0.0	0.0	The same same same same same same same sam
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	88.9	3

ENERGY CALCULATIONS

BUILDING 10250

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10250

CHECKED BY: KC/WLC

PREPARED BY: CSW/BMG

EMC NO.: 1406-006

06-Apr-95

PAGE 1 OF 2

Building Sq.Ft.:

18,553

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

Stop Time

AHU1

Typical Building Information

Typical Bullating information								
Category	Construction	Use	Occ.	Day				
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT				

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

	•	M	T	W	TH	F	<u> </u>
Required Operation Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG	:	8000
CFM - CLG		0
% OA		100.00%
% Area		17.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR		9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10250

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,789.6	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	,
Night Setback	0.0	0.0	174.4	
Sub Total	0.0	12,801.7	174.4	***************************************
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	63.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		<u>'</u>		
Run Time, and Safety Alarms				3
TOTAL	0.0	12,801.7	237.4	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10250

CHECKED BY: KC/WLC

06-Apr-95 PREPARED BY: CSW/BMG

PAGE 1 OF 2

DATE:

EMC NO.: 1406-006

Building Sq.Ft.:

18,553

System Type

System Name:

H&V UNIT

System Number:

AHU2

Typical Building Information

			,			
C	ategory	Construction	Use	Occ.	Day	
	16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT	

Enter Weeks of Summer:

20

Enter Weeks of Winter:	32

Required Operation	S	M	1	VV	I II	г	3
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		8
Load Factor		0.8
CFM - HTG		5265
CFM - CLG		0
% OA		25.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10250

System Type

2

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	14,042.8	0.0	
Optimum ST/SP	0.0	1,079.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	296.2	
Sub Total	0.0	15,122.3	296.2	****
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	107.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				:
TOTAL	0.0	15,122.3	403.2	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10250

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

18,553

System Type

System Name:

H&V UNIT

System Number:

AHU3

Typical Building Information

Typical Danama members							
Category		Construction	Use	Occ.	Day		
3	16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		4670
CFM - CLG		0
% OA		100.00%
% Area		15.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HŘSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10250

System Type System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	17,001.1	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	***************************************
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	261.3	
Sub Total	0.0	18,308.0	261.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	94.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	18,308.0	355.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

53

10250

BLDG:

Building Sq.Ft.: System Type 18,553

System Name: System Number: H&V UNIT AHU4

Typical Building Informatio

	Typical Building Information								
Category		Construction	Use	Occ.	Day				
,	16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		7430
CFM - CLG	0	
% OA	5.00%	
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	AND THE STATE OF T
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

PAGE 1 OF 2

06-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10250

System Type

2

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	25,236.9	0.0	<u> </u>
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	418.1	
Sub Total	0.0	27,177.0	418.1	And the describing and the control of the control o
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	151.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	27,177.0	569.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10250

Building Sq.Ft.:

18,553

System Type System Name:

H&V UNIT AHU5

System Number:

Typical Building Information							
Category		Construction	Use	Occ.	Day		
	16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	w	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		6
Load Factor		0.8
CFM - HTG		3145
CFM - CLG		0
% OA		5.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	har dident become and highly cities in
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

	LOOK UD	INPUT
CONSTANT	LOOK-UP	INPUI
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

06-Apr-95

DATE:

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10250

System Type

2

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	10,725.7	0.0	
Optimum ST/SP	0.0	824.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	174.2	
Sub Total	0.0	11,550.2	174.2	The state of the s
Economizer	0.0	0.0	0.0	T
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	62.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	11,550.2	237.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10250

DATE: 06-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

18,553

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

Typical Building Information

Typious autitude 3 miles and 1							
Category	Construction	Use	Occ.	Day			
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT			

Enter Weeks of Summer:

-

Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		4
Load Factor		0.8
CFM - HTG		600
CFM - CLG		0
% OA		0.00%
% Area		1.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.0	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	1 - 1 - 2 - 4 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10250

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,614.1	0.0	
Optimum ST/SP	0.0	567.8	0.0	,,
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	27.9	V-V-1
Sub Total	0.0	7,181.9	27.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	7,181.9	37.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10250

Building Sq.Ft.: System Type

18,553

System Name:

CONVERTER AND PUMPS

System Number:

HE1

Typical Building Information

Typical building information								
Category	Construction	Use	Occ.	Day				
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT				

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	7.40%
TON CAPC.	0
MBTU CAPC.	1.5064
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

06-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10250

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,349.5	0.0	
Optimum ST/SP	0.0	287.5	0.0	1-7/1
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	128.9	
Sub Total	0.0	3,637.0	128.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	46.6	
HW OA Reset	0.0	0.0	11.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	3,637.0	186.7	3

ENERGY CALCULATIONS

BUILDING 10270

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

25,984

10270

EMC NO.: 1406-006 DATE:

CHECKED BY: KC/WLC

DATE: 04-Apr-95 PREPARED BY: CSW/BMG

PAGE 1 OF 2

Building Sq.Ft.: 25,9

System Type System Name:

H&V UNIT

System Number: HV1

Typical Building Information

Categ	Category Construction		Use	Occ.	Day	
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT	

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	w	TH	F	S :
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		11135
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	. 7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10270

System Type

2

System Name:

H&V UNIT

System Number:

HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	24.1	
Sub Total	0.0	83,884.9	24.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	30.2	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10270

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

04-Apr-95

Building Sq.Ft.: System Type

25,984

System Name:

H&V UNIT

System Number:

HV2

Typical Building Information

·/p										
Category	Construction	Use	Occ.	Day						
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT						

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		27.5
Load Factor		0.8
CFM - HTG		11410
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	89.40%	89.40%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10270

System Type

System Name:

H&V UNIT

System Number:

HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	97,585.7	0.0	
Optimum ST/SP	0.0	3,449.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	24.1	
Sub Total	0.0	101,035.1	24.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.1	·
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	101,035.1	30.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10270

Building Sq.Ft.: System Type

25,984

System Name:

H&V UNIT

System Number:

HV3

Typical Building Information

Typical building information							
		Construction	Use Occ.		Day		
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		6020
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH		0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC		2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR		9.57
OAR		7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

05-Apr-95

DATE:

PAGE 1 OF 2

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

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Bldg Number:

10270

System Type

2

System Name:

H&V UNIT

System Number:

HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	24.1	
Sub Total	0.0	83,884.9	24.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.1	·
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	30.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10270

Building Sq.Ft.:

25,984

System Type System Name:

H&V UNIT

System Number:

HV4

Typical Building Information

Typical building information							
Category	Construction	Use	Occ.	Day			
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

					TII		
Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		4090
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
СОАОНС		0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC		2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR		9.57
OAR		7.40
OPT	188.00	188.00

EMC NO.: 1406-006

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PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

05-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10270

System Type

2

System Name:

H&V UNIT

System Number:

HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	12.0	
Sub Total	0.0	83,884.9	12.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	15.1	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10270

CHECKED BY: KC/WLC PAGE 1 OF 2

DATE:

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

05-Apr-95

Building Sq.Ft.:

25,984

System Type

System Name: System Number: H&V UNIT WITHOUT RETURN FAN

r: MAU-1

Typical Building Information

Typical Bullating Intermedien								
Category		Construction	Use	Occ.	Day			
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		18150
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
НОАОНС	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10270

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	14.4	
Sub Total	0.0	56,826.3	14.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	18.1	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10270

DATE: 05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

25,984

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-2

Typical Building Information

Typica. Dantaing							
Category Construction		Use	Occ.	Day			
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	· W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	Ş	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	9200
CFM - CLG	0
% OA	100.00%
% Area	3.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 86	5.70% 86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	late dibada a a badalawi
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HUAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC		2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10270

System Type

-

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.2	
Sub Total	0.0	56,826.3	7.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	9.1	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10270

05-Apr-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

25,984

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-3

Typical Building Information

,) prod. 2 dr. dr. g							
Category	Construction	Use	Occ.	Day			
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16920
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

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Bldg Number:

10270

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	14.4	
Sub Total	0.0	56,826.3	14.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	18.1	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10270

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

Building Sq.Ft.:

25,984

System Type
System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-4

Typical Building Information

	Typical Building Information									
Categor	γ	Construction	Use	Occ.	Day					
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT					

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	20000
CFM - CLG	0
% OA	100.00%
% Area	6.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HŘSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HUAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	. 0	0
CHWR		9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

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Bldg Number:

10270

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	14.4	
Sub Total	0.0	56,826.3	14.4	A management
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	18.1	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10270

BLDG:

Building Sq.Ft.: System Type

25,984

H&V UNIT WITHOUT RETURN FAN System Name:

System Number:

MAU-5

EMC NO.: 1406-006

05-Apr-95 DATE:

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S		M	T	W	TH	F	S
Start Time		0	700	700	700	700	700	700
Stop Time		0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HF)	15
Load Facto	or	0.8
CFM - HTG	}	10000
CFM - CLG	3	0
% OA	4	100.00%
% Area	3	3.00%
TON CAPC		0
MBTU CAPO	C	0
kW/To	n	0
MOSO	N	12
EFF	=	1
LOOK-UP VALUE		
EFFHF	> 86.70°	% 86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	The state of the first of the property
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10270

System Type

1027

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.2	
Sub Total	0.0	56,826.3	7.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	9.1	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10270

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

05-Apr-95

DATE:

PAGE 1 OF 2

Building Sq.Ft.:

25,984

System Type

System Name: System Number: **H&V UNIT WITHOUT RETURN FAN**

MAU6

Typical Building Information

		.ypioui L	Jananing milotimation		
Г	Category	Construction	Use	Occ.	Day
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	16100
CFM - CLG	0
% OA	100.00%
% Area	5.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	<u> </u>
EFFHP	86.70% 86.70%

	REQUIRED HR/YR	 A. A. Arabada, and A. Arabada, Market
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

LOOK HD	INPUT
	1 11 12 12 12 12 12 12 12 12 12 12 12 12
0.00	0.00
0.00	0.00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
15.77	15.77
9.68	9.68
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00	0.00
0.17	0.17
0.00E+00	0.00E+00
2.36E+03	2.36E+03
9.26E+03	9.26E+03
0	0
9.57	9.57
7.40	. 7.40
188.00	188.00
	0.00 0.00E+00 15.77 9.68 0.00E+00 0.00E+00 0.00 0.17 0.00E+00 7.40

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10270

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	12.0	
Sub Total	0.0	56,826.3	12.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.1	
HW OA Reset	0.0	0.0	0.0	Wilder College of the
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	15.1	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10270

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

05-Apr-95

PAGE 1 OF 2

Building Sq.Ft.:

25,984

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-7

Typical Building Information

Category	Construction	Use	Occ.	Day
1	8 BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

20 32

Enter Weeks of Summer: Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	7.5
Load Factor	0.8
CFM - HTG	16100
CFM - CLG	0
% OA	100.00%
% Area	2.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 83.10	0% 83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10270

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	28,632.0	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	4.8	
Sub Total	0.0	29,644.0	4.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	29,644.0	6.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10270

DATE: 05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

25,984 12

System Type

BASEBOARD RADIATION

System Name: System Number:

HTP1

Typical Building Information

		. , , , , , , , , , ,	Tantania in the same in the sa		,
Γ	Category	Construction	Use	Occ.	Day
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

20 32

Enter Weeks of Summer: Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		3.587
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HŘSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10270

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HTP1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	And the second s
Demand Limit	0.0	0.0	0.0	Market and the second s
Night Setback	0.0	0.0	57.7	
Sub Total	0.0	12,616.7	57.7	A CONTRACTOR OF THE PARTY OF TH
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	• 0.0	0.0	14.7	
HW OA Reset	0.0	0.0	26.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	-
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	99.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

25,984

10270

DATE: 05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type

9 System Name:

System Number:

CONVERTER AND PUMPS

HTP2

Typical Building Information

Typious Dunaing internation									
Category Construction		Use	Occ.	Day					
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.62
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	Sec. 5 (4) 200 5 20 1 2 2 2 5 4
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10270

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HTP2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	·
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	34.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	34.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10270

DATE: 05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

25,984

System Type

CONVERTER AND PUMPS

System Name: System Number:

HTP3

Typical Building Information

Typica: Banang metalica									
Category Construction		Use	Occ.	Day					
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT					

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.258
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	NOT COUNTY AND A STOCK
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	-	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10270

System Type

System Name:

9 **CONVERTER AND PUMPS**

System Number:

HTP3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	31.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	31.5	3

ENERGY CALCULATIONS

BUILDING 10412

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10,412

DATE: 01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

54,872

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

Typical Building Information

	.,,p.,						
Category		Construction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	M	T	W	TH	<u> </u>	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.5123
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	MARIE SELECTION OF THE PARTY
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,412

System Type

.,....

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	3.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,	1 PM MATERIAL CONTRACTOR CONTRACT			
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	3.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10,412

01-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

59,078

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

Typical Building Information

Typical Dulland						
Category		Construction	Use	Occ.	Day	
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI	

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.9801
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,412

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	7.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10412

EMC NO.: 1406-006

DATE:

01-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

18,656

System Type

14 **VENTILATION**

System Name: System Number:

AHU1

Typical Building Information

Category	(Construction	Use	Occ.	Day
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4779
% OA	***************************************	100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	ļ

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10412

System Type System Name:

14 VENTILATION

System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10412

DATE: 01-Apr-95 PREPARED BY: CSW/BMG

PAGE 1 OF 2

EMC NO.: 1406-006

CHECKED BY: KC/WLC

Building Sq.Ft.:

System Type

VENTILATION

System Name: System Number:

AHU2

Typical Building Information

Typical Danting Internation									
Category Construction		Use	Occ.	Day					
1.	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI					

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	75 . 45 t.	INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4566
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS	REQUIRED	I
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296]
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV		0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10412

System Type

14 VENTILATION

System Name: System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	· · · · · · · · · · · · · · · · · · ·
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

18,656

10412

DATE: 12-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

System Type System Name:

14 **VENTILATION**

System Number:

AHU-3

Typical Building Information

Typical Danting Internation								
Category	Category Construction		Occ.	Day				
1	4 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	3
Load Factor	0.8
CFM - HTG	4566
CFM - CLG	0
% OA	100.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	5
EFF	1
LOOK-UP VALUE	
EFFHP 79.00°	% 79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number:

10412

System Type

14

System Name:

VENTILATION

System Number:

AHU-3

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10412

DATE: 12-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

18,656

System Type System Name:

14 **VENTILATION**

System Number:

AHU-4

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	3
Load Factor	0.8
CFM - HTG	4779
CFM - CLG	0
% OA	100.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	5
EFF	1
LOOK-UP VALUE	
EFFHP 79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

0.0

0.0

12-Apr-95 PAGE 2 OF 2

0

0

Bldg Number:

10412

System Type

14

System Name:

Chiller Demand Limit

TOTAL

Remote Monitoring, Maintenance, Run Time, and Safety Alarms

VENTILATION

System Number: AHU-4

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	-
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	

0.0

0.0

0.0

5,092.0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

O CEC

10412

EMC NO.: 1406-006 DATE:

DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

18,656

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

Typical Building Information

Typical Dallang Information							
Category		Construction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	750
CFM - CLG	0
% OA	100.00%
% Area	12.75%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65	.00% 65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10412

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	115.7	
Sub Total	0.0	1,683.3	115.7	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	129.6	3.00 (1.00 (

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

18,656

10412

DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU7

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	0.33	
Load Factor	0.8	
CFM - HTG	750	
CFM - CLG	0	
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		_
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10412

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: AHU7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	115.7	
Sub Total	0.0	1,683.3	115.7	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	129.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10412

DATE: 02-Арг-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

18,656

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

8UHA

Typical Building Information

.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,								
Category Construction		Use	Occ.	Day				
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:

20

Enter Weeks of Winter:	32

Required Operation	S	IVI	1	VV	IП		3
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG	0	
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	. 0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10412

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

8UHA

1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	•
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	115.7	
Sub Total	0.0	1,683.3	115.7	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	129.6	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10412

02-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

18,656 **Building Sq.Ft.:**

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: AHU9

Typical Building Information

Typiout 2 and 3								
Category Construction		on Use	Occ.	Day				
	14 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Ston Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT		
Motor HP	Motor HP			
Load Factor		0.8		
CFM - HTG		750		
CFM - CLG		0		
% OA	100.00%			
% Area	12.75%			
TON CAPC.		0		
MBTU CAPC.		0		
kW/Ton		0		
MOSON		12		
EFF	1			
LOOK-UP VALUE				
EFFHP	65.00%	65.00%		

 Conceens the property of the contract of the cont	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
СОАОНС	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FVFV	0	0
CHWR		9.57
OAR	7.40	- 7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10412

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	115.7	
Sub Total	0.0	1,683.3	115.7	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,	·	·		
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	129.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10412

EMC NO.: 1406-006

DATE: 02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

38,216

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU10

Typical Building Information

Typious Dustaning the community of the c								
Category Construction		Use	Occ.	Day				
1:	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT				

Enter Weeks of Summer:

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.5
Load Factor	0.8
CFM - HTG	1860
CFM - CLG	0
% OA	100.00%
% Area	19.30%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 6	65.00% 65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10412

System Type System Name: 1 H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	84.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	84.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10412

DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

38,216

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: AHU11

Typical Building Information

Typical Building Information							
Category		Construction	Use	Occ.	Day		
- Outogory	15		ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	1350
CFM - CLG	0
% OA	100.00%
% Area	19.30%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.0	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0]
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH		0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC		0.00E+00
HOAOH		0.00
HOAOHC		0.00
COAOC		0.00E+00
COAOHC		0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHO		0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC		1.40E+04
NSC	0.00E+00	0.00E+00
F۷		0
CHWF	9.57	9.57
OAF	7.40	7.40
OP1	0.00	0.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10412

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	84.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	V-0
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	0.0	84.8	simisott.

ENERGY CALCULATIONS

BUILDING 10400

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10400

EMC NO.: 1406-006 DATE:

DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

11,249

System Type

•

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

typical ballating information							
Category	Construction	Use	Occ.	Day			
	17 BRICK	BN HQ BLDG	0600-1700	SUN-SAT			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	And the first that the second of the second
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10400

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	147.6	
Sub Total	0.0	8,501.7	147.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,501.7	159.0	3.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10400

EMC NO.: 1406-006 05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

11,249

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

Typical Building Information

		i y picai E	diffatting information		
Category		Construction	Use	Occ.	Day
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	
Load Factor	0.8
CFM - HTG	210
CFM - CLG	
% OA	100.00%
% Area	4.00%
TON CAPC.	
MBTU CAPC.	(
kW/Ton	
MOSON	12
EFF	
LOOK-UP VALUE	
EFFHP	69.20% 69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10400

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	28.1	
Sub Total	0.0	4,791.4	28.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,791.4	30.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10400

04-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.: System Type

11,249

System Name:

CONVERTER AND PUMPS

System Number:

HE1

Typical Building Information

	i y pioui u	anang mornianon		
Category	Construction	Use	Occ.	Day
1	7 BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Ston Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number: System Type

10400

System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	· · · · · · · · · · · · · · · · · · ·
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	- All and a second seco
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,328.6	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,328.6	1.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10400

PAGE 1 OF 2

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

04-Apr-95

Building Sq.Ft.: System Type

11,249

12

System Name:

BASEBOARD RADIATION

System Number: HE2

Typical Building Information

Typical Building information							
Category		Construction	Use	Occ.	Day		
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG	0	
CFM - CLG	0	
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
 HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
 DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10400

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	527.0	
Sub Total	0.0	2,397.8	527.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	40.9	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,397.8	568.7	3

ENERGY CALCULATIONS

BUILDING 10410

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10410

EMC NO.: 1406-006

DATE: 0

DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

12,450

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

Typical Dallaring Information							
Category		Construction	Use	Occ.	Day		
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT		

Enter Weeks of Summer:

20

Enter Weeks of Winter:

ter: 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0
Otop Time							

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HŘSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10410

System Type

1041

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	163.3	
Sub Total	0.0	8,501.7	163.3	V
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	***************************************
DDC Control	0.0	0.0	12.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,501.7	176.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10410

Building Sq.Ft.:

12,450

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: AHU-2

Typical Building Information

		i ypicai L	Junuing imorniaus	711	
Category		Construction	Use	Occ.	Day
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	1
Load Factor	0.8
CFM - HTG	210
CFM - CLG	0
% OA	100.00%
% Area	4.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 69.20%	69.20%

HOURS		PRESENT
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

05-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

DATE:

PAGE 1 OF 2

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10410

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	31.1	
Sub Total	0.0	4,791.4	31.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				***************************************
Run Time, and Safety Alarms				3
TOTAL	0.0	4,791.4	33.5	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10410

EMC NO.: 1406-006

04-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

12,450

System Type

System Name:

CONVERTER AND PUMPS

System Number:

Typical Building Information

		. , , , , , , , , ,		,	
ſ	Category	Construction	Use	Occ.	Day
1	1	7 BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:

32

Required Operation	S	М	T	W	TH	F	S
Start Time	(600	600	600	600	600	0
Stop Time	(1700	1700	1700	1700	1700	0

Present Operations	S	Μ '	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.2602
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10410

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,328.6	0.0	
Economizer	0.0	0.0	0.0	15.
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,328.6	1.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10410

DATE:

04-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

12,450

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

Typical Building Information

Category	Construction	Use	Occ.	Day
1	7 BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.75
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	75.00%
TON CAPC.	0
MBTU CAPC.	0.1117
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10410

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	583.3	
Sub Total	0.0	2,397.8	583.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,397.8	629.3	3

ENERGY CALCULATIONS

BUILDING 10414

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10,414

EMC NO.: 1406-006

DATE: 01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

59,078

9

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE-1

Typical Building Information

Typical Dullaing Information									
Category Construction		Use	Occ.	Day					
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.5123
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,414

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	3.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	3.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10,414

Building Sq.Ft.: System Type 59,078

12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

Typical Building Information

Typical Building Information								
Category Construction		Use	Occ.	Day				
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT			
Motor HP					
Load Factor		0.8			
CFM - HTG		0			
CFM - CLG		0			
% OA		0.00%			
% Area		0.00%			
TON CAPC.		0			
MBTU CAPC.		0.9801			
kW/Ton		0			
MOSON		7			
EFF	1				
LOOK-UP VALUE					
EFFHP	65.00%	65.00%			

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

EMC NO.: 1406-006

DATE: 01-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

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PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,414

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	7.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10414

EMC NO.: 1406-006

DATE: 01-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

20,087

Building Sq.Ft.: System Type

System Name: System Number:

VENTILATION AHU1

Typical Building Information

Typical Bullung Information						
Category	Construction	Use	Occ.	Day		
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	4.5	INPUT
Motor HP	3	
Load Factor	0.8	
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10414

System Type

14

System Name:

VENTILATION

System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10414

EMC NO.: 1406-006

DATE: 01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

20,087

System Type System Name:

14 **VENTILATION**

System Number:

AHU2

Typical Building Information

Typical Dailetti Simoniano.							
Category	Construction	Use	Occ.	Day			
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4566
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS	REQUIRED	PRESENT
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV		0
CHWR		9.57
OAR		7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10414

System Type

14

System Name:

VENTILATION

System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10414

DATE: 01-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

20,087

Building Sq.Ft.: System Type

14

System Name:

VENTILATION

System Number:

AHU3

Typical Building Information

Typical building information							
Category	C	onstruction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	M	Τ	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	_0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT				
Motor HP		3				
Load Factor		0,8				
CFM - HTG						
CFM - CLG	4566					
% OA	100.00%					
% Area		0.00%				
TON CAPC.		0				
MBTU CAPC.		0				
kW/Ton		0				
MOSON		5				
EFF		1				
LOOK-UP VALUE						
EFFHP	79.00%	79.00%				

HOURS	REQUIRED	PA A A A A A
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

01-Apr-95 PAGE 2 OF 2

Date:

Bldg Number:

10414

System Type

14 VENTILATION

System Name: System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	· · · · · · · · · · · · · · · · · · ·
Duty Cycle	0.01	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	71074 P
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6

CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

0.007

10414

EMC NO.: 1406-006

DATE: 0

DATE: 01-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

20,087

System Type

7

System Name:

VENTILATION

System Number:

AHU4

Typical Building Information

		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
i	Category	Construction	Use	Occ.	Day
	14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10414

System Type

14

System Name:

VENTILATION

System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10414

EMC NO.: 1406-006 DATE:

02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

20,087

Building Sq.Ft.:

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

Typical Building Information

Typical Bullating Information							
Category		Construction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC		110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10414

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	•
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	124.6	
Sub Total	0.0	1,683.3	124.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	15.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	139.5	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10414

Building Sq.Ft.: System Type

20,087

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU7

Typical Building Information

Typical building information							
Category Construction		Use	Occ.	Day			
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

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02-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10414

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	124.6	
Sub Total	0.0	1,683.3	124.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	15.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	139.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10414

DATE:

02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

20,087

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

8UHA

Typical Building Information

.yp.ou out _ ou								
Category Construction		Use	Occ.	Day				
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:

20 32

Required Operation	S	M	Т	W	TH	Į.	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Τ	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR		7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10414

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	124.6	
Sub Total	0.0	1,683.3	124.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	15.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	139.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10414

DATE:

02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

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EMC NO.: 1406-006

20,087

Building Sq.Ft.: System Type

AHU9

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

Typical Building Information

, y p. o							
Category		Construction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS			INPUT
Moto	or HP		0.33
Load	actor		0.8
CFM -	HTG		750
CFM -	CLG		0
C	% OA		100.00%
%	Area		12.75%
TON C	APC.		0
MBTU C	CAPC.		0
k\	N/Ton		0
MC	DSON		12
	EFF		1
LOOK-UP VALU	E		
El	FHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10414

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	124.6	
Sub Total	0.0	1,683.3	124.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	15.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms	3			
TOTAL	0.0	1,683.3	139.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10414

BLDG:

Building Sq.Ft.: System Type

38,991

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

AHU10

Typical Building Information

Typical Building Information							
Category Construction		Use	Occ.	Day			
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.5
Load Factor		0.8
CFM - HTG		1860
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

LOOVIID	INPUT
	0 10 88 FF F 100 100 10
0.00	0.00
0.00	0.00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00	0.00
0.00	0.00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00	0.00
0.17	0.17
0.00E+00	0.00E+00
1.40E+04	1.40E+04
0.00E+00	0.00E+00
0	0
9.57	9.57
7.40	7.40
0.00	0.00
	0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.17 0.00E+00 0.00E+00 0.00E+00 0.00E+00 1.40E+04 0.00E+00 0.957 7.40

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

02-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10414

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	91.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	91.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

DATE: 02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

38,991

10414

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU11

Typical Building Information

Typical Dullang Information							
Category Construction		Use	Occ.	Day			
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT			

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	0.33	
Load Factor		0.8
CFM - HTG		1350
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10414

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	91.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
Run Time, and Safety Alarms TOTAL	0.0	0.0	91.3	3

ENERGY CALCULATIONS

BUILDING 10420

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10420

EMC NO.: 1406-006

DATE: 05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

12,450

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

	i y pioui E	difating milotitidation		
Category	Construction	Use	Occ.	Day
1	7 BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	H	F	S
Start Time	0	0	. 0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	1230
CFM - CLG	0
% OA	100.00%
% Area	21.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	Mari Palasahuungan Militira M
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10420

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	****
Night Setback	0.0	0.0	163.3	
Sub Total	0.0	8,501.7	163.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,501.7	176.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10420

PAGE 1 OF 2

DATE:

EMC NO.: 1406-006

05-Apr-95

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

Building Sq.Ft.:

12,450

System Type 1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

Typical Building Information

	. , , , , , , , , , ,	, amaing miletine		
Category	Construction	Use	Occ.	Day
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:

20

Tiller Arcens of Attiller.	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	kawan Mwaliota a ali ne a li fiw
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10420

System Type

1042

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	31.1	
Sub Total	0.0	4,791.4	31.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,791.4	33.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10420

DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

12,450

System Type

9

System Name:

CONVERTER AND PUMPS

System Number:

HE1

Typical Building Information

. y p to 2. 2 and 1. 3 th 2 and 1. 3							
Category	Construction	Use	Occ.	Day			
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT			

Enter Weeks of Summer:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	N - N IN 19 N N N SU 1995 ARE
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10420

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,328.6	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,328.6	1.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10420

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

04-Apr-95

PAGE 1 OF 2

Building Sq.Ft.:

12,450 12

System Type System Name:

BASEBOARD RADIATION

System Number:

HF2

Typical Building Information

.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
Category	Construction	Use	Occ.	Day			
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT			

Enter Weeks of Summer:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.75
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	75.00%
TON CAPC.	0
MBTU CAPC.	0.1117
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	Miller (1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10420

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	583.3	
Sub Total	0.0	2,397.8	583.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	<u> </u>
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,397.8	629.3	3

ENERGY CALCULATIONS

BUILDING 10422

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10,422

01-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

47,300

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

Typical Building Information

	Typical Denting morning							
ĺ	Category	Construction	Use	Occ.	Day			
	1	4 BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.3875
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	Mariner et al. 1930 au 1931
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,422

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	•
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	2.9	3.

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10,422

BLDG:

Building Sq.Ft.: System Type

Start Time

Stop Time

47,300 12

System Name:

System Number:

BASEBOARD RADIATION

HE-2

Typical Building Information

Category Construction		Use	Occ.	Day	
	14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

0

2400

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

0

2400

Required Operation	s	M	Т Т	W	TH	F

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

0

2400

0

2400

0

2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.6683
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

0

2400

EMC NO.: 1406-006

01-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

0

2400

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,422

System Type

1

System Name:

BASEBOARD RADIATION

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	4.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10422

Building Sq.Ft.: System Type

11,825

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

Typical Dallang Internation									
Category Construction		Use	Occ.	Day					
<u> </u>	14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	0.33	
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

02-Apr-95

DATE:

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10422

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	97.8	
Sub Total	0.0	1,683.3	97.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	109.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10422

DATE:

02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

11,825

AHU2

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

Typical Building Information

		. , p.va. –	449		
Category		Construction	Use	Occ.	Day
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI

0

Enter Weeks of Summer:

20 32

1700

Enter Weeks of Winter:

Stop Time

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	· 2400	2400	2400	2400

INPUTS		INPUT		
Motor HP				
Load Factor		0.8		
CFM - HTG		770		
CFM - CLG		0		
% OA		100.00%		
% Area		17.00%		
TON CAPC.		0		
MBTU CAPC.		0		
kW/Ton		0		
MOSON		12		
EFF		1		
LOOK-UP VALUE				
EFFHP	65.00%	65.00%		

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10422

System Type

•

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	97.8	
Sub Total	0.0	1,683.3	97.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	109.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10422

02-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

11,825

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU4

Typical Building Information

Typical Bullating information							
Category	Construction	Use	Occ.	Day			
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	0.33	
Load Factor		0.8
CFM - HTG	770	
CFM - CLG	0	
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS	REQUIRED	PRESENT
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10422

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	97.8	
Sub Total	0.0	1,683.3	97.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	109.5	. 3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10422

Building Sq.Ft.:

35,475

System Type

AHU5

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

Typical Building Information

Typical Building information							
Category		Construction	Use	Occ.	Day		
	15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT		

Enter Weeks of Summer:

Enter Weeks of Winter:

32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT				
Motor HP		0.33				
Load Factor		0.8				
CFM - HTG						
CFM - CLG	0					
% OA		100.00%				
% Area		16.70%				
TON CAPC.		0				
MBTU CAPC.		0				
kW/Ton		0				
MOSON		12				
EFF		1				
LOOK-UP VALUE						
EFFHP	65.00%	65.00%				

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

01-Apr-95

DATE:

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10422

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	84.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,			1111111111	
Run Time, and Safety Alarms	3			
TOTAL	0.0	0.0	84.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10422

Building Sq.Ft.: System Type

35,475

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

Typical Building Information

Typical Building information								
Category	Construction	Use	Occ.	Day				
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT				

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1060
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HŘSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

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PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

01-Apr-95

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10422

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	-
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	•
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	84.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms	3			
TOTAL	0.0	0.0	84.5	3

ENERGY CALCULATIONS

BUILDING 10450

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10450

DATE: 06-Apr-95 PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

9,486

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

Typical Building Information								
Category		Construction	Use	Occ.	Day			
	16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT			

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	Т	w	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		8000
CFM - CLG		0
% OA		100.00%
% Area		17.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10450

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	13,165.1	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	174.4	
Sub Total	0.0	14,177.2	174.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	63.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	14,177.2	237.4	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

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10450

EMC NO.: 1406-006

DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

9,486

System Type System Name:

H&V UNIT

System Number:

AHU2

Typical Building Information

			i ypicai E	fulluling illionilation		
	Category		Construction	Use	Occ.	Day
İ		16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:

20 32

Litter Weeks Or Guilliner.	
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		8
Load Factor		0.8
CFM - HTG		5265
CFM - CLG		0
% OA		25.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS	REQUIRED	PRESENT
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10450

System Type
System Name:

2 H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	14,042.8	0.0	
Optimum ST/SP	0.0	1,079.5	0.0	
Duty Cycle	0.0	0.0	0.0	****
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	151.4	
Sub Total	0.0	15,122.3	151.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	54.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	15,122.3	206.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10450

EMC NO.: 1406-006

DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

9,486

System Type

2 H&V UNIT

System Name: System Number:

AHU3

Typical Building Information

Typical building information								
Category		Construction	Use	Occ.	Day			
	16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	10
Load Factor	0.8
CFM - HTG	4670
CFM - CLG	0
% OA	100.00%
% Area	15.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 85.	80% 85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10450

System Type System Name: 2 H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	17,001.1	0.0	- Production
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	***************************************
Night Setback	0.0	0.0	133.6	
Sub Total	0.0	18,308.0	133.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	48.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		,		
Run Time, and Safety Alarms				3
TOTAL	0.0	18,308.0	181.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10450

EMC NO.: 1406-006

06-Apr-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

9,486

System Type

2

System Name:

H&V UNIT AHU4

System Number:

Typical Building Information

	Typical Bulluling Information								
Category	Construction	Use	Occ.	Day					
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT					

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	М	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	. 0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	7430
CFM - CLG	0
% OA	5.00%
% Area	24.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10450

System Type

2

System Name:

H&V UNIT

System Number: AHU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	25,236.9	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	213.8	
Sub Total	0.0	27,177.0	213.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	77.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	27,177.0	291.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10450

EMC NO.: 1406-006

DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

9,486

System Type

H&V UNIT

System Name: System Number:

AHU5

Typical Building Information

Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	6
Load Factor	0.8
CFM - HTG	3145
CFM - CLG	0
% OA	5.00%
% Area	10.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 81	.60% 81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	A Control of the Control
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10450

System Type

2

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	10,725.7	0.0	
Optimum ST/SP	0.0	824.5	0.0	100000000000000000000000000000000000000
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	89.1	
Sub Total	0.0	11,550.2	89.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	32.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	11,550.2	121.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10450

EMC NO.: 1406-006 DATE:

06-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

9,486

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

AHU6 System Number:

Typical Building Information

	Typical Ballating Information										
ſ	Category	Construction	Use	Occ.	Day						
ľ	16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT						

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		4
Load Factor		0.8
CFM - HTG		600
CFM - CLG		0
% OA		0.00%
% Area		1.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10450

System Type

•

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,614.1	0.0	
Optimum ST/SP	0.0	567.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	14.3	The state of the s
Sub Total	0.0	7,181.9	14.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	5.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	7,181.9	19.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG: 9,486

10450

EMC NO.: 1406-006

DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type

9

System Name:

CONVERTER AND PUMPS

System Number:

HE1

Typical Building Information

		. , p.ou	.aa		
	Category	Construction	Use	Occ.	Day
r	16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	7.40%
TON CAPC.	0
MBTU CAPC.	1.5064
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number: System Type

10450 9

System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,349.5	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	65.9	
Sub Total	0.0	3,637.0	65.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	23.8	
HW OA Reset	0.0	0.0	11.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	3,637.0	100.9	Marine V St. La Fill 1994

ENERGY CALCULATIONS

BUILDING 10470

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10470

EMC NO.: 1406-006

DATE: 04-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

32,213

System Type

2

System Name:

H&V UNIT

System Number:

HV1

Typical Building Information

	i y picar	rananing imorniaacin		,
Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		11135
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10470

System Type

System Name:

H&V UNIT

System Number:

HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	-
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	*******
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	29.8	
Sub Total	0.0	83,884.9	29.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	7.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	37.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG: 32,213

10470

EMC NO.: 1406-006

DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type

2 H&V UNIT

System Name: System Number:

HV2

Typical Building Information

Typical building information						
Category		Construction	Use	Occ.	Day	
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT	

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		27.5
Load Factor		0.8
CFM - HTG		11410
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	89.40%	89.40%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bidg Number: System Type

10470

System Name:

System Number:

H&V UNIT HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	97,585.7	0.0	
Optimum ST/SP	0.0	3,449.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	29.8	
Sub Total	0.0	101,035.1	29.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	7.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	101,035.1	37.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10470

EMC NO.: 1406-006

CHECKED BY: KC/WLC

05-Apr-95 PREPARED BY: CSW/BMG

PAGE 1 OF 2

Building Sq.Ft.:

32,213

System Type System Name:

H&V UNIT

System Number:

HV3

Typical Building Information

Typical building information							
Category		Construction	Use	Occ.	Day		
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		6020
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	TO 00000 YEAR A PARKET OF T
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10470

System Type

2 **H&V UNIT**

System Name: System Number:

HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	29.8	
Sub Total	0.0	83,884.9	29.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	7.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	83,884.9	37.4	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10470

DATE:

11-Арг-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

32,213

Building Sq.Ft.: System Type

2

System Name:

H&V UNIT

System Number:

HV4

Typical Building Information

Typical Building Information								
Category		Construction	Use	Occ.	Day			
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		4090
CFM - CLG		0
% OA	100.00%	
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

1000011000000000000000000000000000000	REQUIRED	A140000 1000 CONTRACTOR
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

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Bldg Number:

10470

System Type

2

System Name:

H&V UNIT

System Number:

HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	14.9	
Sub Total	0.0	83,884.9	14.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				:
TOTAL	0.0	83,884.9	18.7	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10470

1600

1600

05-Apr-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

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S 700

1600

700

1600

Building Sq.Ft.:

32,213

System Type

System Name:

Start Time

Stop Time

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-1

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

1600

Required Operation	S	М	Т	W	TH	
Start Time	0	700	700	700	700	

0 j

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

1600

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		18150
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton	:	0
MOSON	:	12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

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Bldg Number:

10470

System Type
System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	17.9	
Sub Total	0.0	56,826.3	17.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	4.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	22.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

32,213

10470

Building Sq.Ft.: System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-2

Typical Building Information

Typical Danaing information							
Category	Category Construction		Use	Occ.	Day		
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	9200
CFM - CLG	0
% OA	100.00%
% Area	3.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC		0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

05-Apr-95

DATE:

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

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Bldg Number:

10470

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	8.9	
Sub Total	0.0	56,826.3	8.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				11-1
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	11.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10470

EMC NO.: 1406-006

05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

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Building Sq.Ft.:

32,213

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-3

Typical Building Information

Typiour Dunaing Internation						
Category	Construction	Use	Occ.	Day		
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16920
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

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Bldg Number:

10470

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	17.9	
Sub Total	0.0	56,826.3	17.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	4.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	22.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10470

DATE: 05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

32,213

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: MAU-4

Typical Building Information

Category		Construction	Use	Occ.	Day
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	20000
CFM - CLG	0
% OA	100.00%
% Area	6.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 86	.70% 86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HŘSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HŘSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10470 1

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	The state of the s
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	17.9	
Sub Total	0.0	56,826.3	17.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	4.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	22.5	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10470

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

05-Apr-95

Building Sq.Ft.: System Type

32,213

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-5

Typical Building Information

Typica: Danumg internation							
Category		Construction	Use	Occ.	Day		
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10000
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

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Bldg Number:

10470

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	1990
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	8.9	,
Sub Total	0.0	56,826.3	8.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.3	
HW OA Reset	0.0	0.0	0.0	A
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	11.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10470

05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.: 32,213

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

MAU6

Typical Building Information

Typical Bullating Information										
Category		Construction	Use	Occ.	Day					
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT					

Enter Weeks of Summer:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16100
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10470

System Type

.

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	-
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	14.9	
Sub Total	0.0	56,826.3	14.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	18.7	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10470

EMC NO.: 1406-006

05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

32,213

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-7

Typical Building Information

	- 7,										
	Category Construction		Use	Occ.	Day						
Γ	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT						

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	(700	700	700	700	700	700
Stop Time	(1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	104650		INPUT
Moto	r HP		7.5
Load F	actor		0.8
CFM -	HTG		16100
CFM -	CLG		0
9	6 OA		100.00%
%	Area		2.00%
TON C	APC.		0
MBTU C	APC.		0
kV	V/Ton		0
MC	SON		12
	EFF		1
LOOK-UP VALUE			
EF	FHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOÁUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10470

System Type
System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	28,632.0	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	6.0	
Sub Total	0.0	29,644.0	6.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	29,644.0	7.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10470

DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

32,213

System Type

12 BASEBOARD RADIATION

System Name: System Number:

HTP1

Typical Building Information

		. y p.ou	41141113		
Category	10	Construction	Use	Occ.	Day
- Juliego J	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT		
Motor HP	Motor HP			
Load Factor	8.0			
CFM - HTG	0			
CFM - CLG		0		
% OA		0.00%		
% Area		24.00%		
TON CAPC.		0		
MBTU CAPC.		3.587		
kW/Ton		0		
MOSON		7		
EFF		1		
LOOK-UP VALUE				
EFFHP	81.60%	81.60%		

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319]

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWF	9.57	9.57
OAF	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10470

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HTP1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/vr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	W-4
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	***************************************
Night Setback	0.0	0.0	71.6	
Sub Total	0.0	12,616.7	71.6	to to
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	18.3	
HW OA Reset	0.0	0.0	26.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	***************************************
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	116.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10470

DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

32,213

System Type

9

System Name:

CONVERTER AND PUMPS

System Number: HTP2

Typical Building Information

Typical Danieng menung							
Category		Construction	Use	Occ.	Day		
<u> </u>	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Ston Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	5
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	4.62
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	
	1,320	3,360
Cooling HRSON		5,376
Heating HRSON	2,112	
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10470 9

System Type System Name:

CONVERTER AND PUMPS

System Number:

HTP2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	34.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	34.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10470

DATE: 05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

32,213

System Type

CONVERTER AND PUMPS

System Name: System Number:

HTP3

Typical Building Information

Typical Bullating Information						
Category		Construction	Use	Occ.	Day	
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT	

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Ston Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.258
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10470

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HTP3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	31.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	31.5	3

ENERGY CALCULATIONS

BUILDING 10480

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10480

EMC NO.: 1406-006

DATE: 04-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

28,057

System Type

2

System Name:

H&V UNIT

System Number:

HV1

Typical Building Information

Typical Ballaning information							
Category	Construction	Use	Occ.	Day			
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS			INPUT
Mot	or HP		22.5
Load	Factor		0.8
CFM -	HTG		11135
CFM ·	CLG		0
1	% OA		33.00%
%	Area		10.00%
TON C	APC.		0
MBTU (CAPC.		0
k'	W/Ton		0
M	OSON		12
	EFF		1
LOOK-UP VALU	E		
E	FFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10480

System Type

2

System Name:

H&V UNIT

System Number:

HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	26.0	
Sub Total	0.0	83,884.9	26.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				-
Run Time, and Safety Alarms				;
TOTAL	0.0	83,884.9	32.6	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10480

04-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

28,057

System Type

System Name:

H&V UNIT

System Number:

HV2

Typical Building Information

Typical Building Information						
Category	Construction	Use	Occ.	Day		
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	27.5
Load Factor	0.8
CFM - HTG	11410
CFM - CLG	0
% OA	33.00%
% Area	10.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 8	9.40% 89.40%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HŘSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bidg Number: System Type 10480

System Type
System Name:

2 H&V UNIT

System Number:

HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	97,585.7	0.0	•
Optimum ST/SP	0.0	3,449.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	Will all the state of the state
Night Setback	0.0	0.0	26.0	
Sub Total	0.0	101,035.1	26.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	101,035.1	32.6	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

28,057

10480

04-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type

System Name:

H&V UNIT HV3

System Number:

Typical Building Information

.yp.ou. Daning									
Category	Construction	Use	Occ.	Day					
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT					

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Ston Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INP	UT
Motor HP		22.5
Load Factor		8.0
CFM - HTG	(6020
CFM - CLG		0
% OA	33.	00%
% Area	10.	00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10% 88.	10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	-
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT		
HOAUH	0.00	0.00		
HOAUHC	0.00	0.00		
COAUC	0.00E+00	0.00E+00		
COAUHC	0.00E+00	0.00E+00		
НОАОН	15.77	15.77		
HOAOHC	9.68	9.68		
COAOC	0.00E+00	0.00E+00		
COAOHC	0.00E+00	0.00E+00		
DC DUTY	0.00	0.00		
DC DEMAN	0.17	0.17		
ECC	0.00E+00	0.00E+00		
ECHC	0.00E+00	0.00E+00		
NSUCC		0.00E+00		
NSUCHO	0.00E+00	0.00E+00		
DDCCHC	0.00E+00	0.00E+00		
DDCCC	0.00E+00	0.00E+00		
DSC	2.36E+03	2.36E+03		
NSC	9.26E+03	9.26E+03		
FV	0	0		
CHWR	9.57	9.57		
OAR	7.40	7.40		
OPT	188.00	188.00		

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10480

System Type

2

System Name:

H&V UNIT

System Number:

HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	26.0	
Sub Total	0.0	83,884.9	26.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.6	,
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	32.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10480

DATE: 05-Apr-95

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

28,057

System Type

2

System Name:

H&V UNIT

HV4

System Number:

Typical Building Information

	Typical Building Information								
Category		Construction	Use	Occ.	Day				
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		4090
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
	2,112	5,376
Heating HRSON	3,441	8,760
C/H HRSON		0,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10480

System Type

2

System Name:

H&V UNIT

System Number:

HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	The state of the s
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	13.0	
Sub Total	0.0	83,884.9	13.0	·
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	16.3	- 3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10480

DATE: 05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

28,057

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-1

Typical Building Information

		. , p		-	
Category		Construction	Use	Occ.	Day
	18	D	VEH MNT SHOP	0700-1900	SUN-SAT

20 32

Enter Weeks of Summer: Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		18150
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10480

System Type

.

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	15.6	
Sub Total	0.0	56,826.3	15.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	4.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	19.6	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10480

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

05-Apr-95

PAGE 1 OF 2

Building Sq.Ft.:

28,057

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-2

Typical Building Information

Category	Category Construction		Occ.	Day			
	18 BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9200
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	 A.A. A. A. SOC ATTLA 18
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10480

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	<u> </u>
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.8	
Sub Total	0.0	56,826.3	7.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	1-1-1-1
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				. 3
TOTAL	0.0	56,826.3	9.8	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10480

EMC NO.: 1406-006

DATE: 05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

28,057

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-3

Typical Building Information

Typical Bullating Information								
Category	Construction	Use	Occ.	Day				
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	16920
CFM - CLG	0
% OA	100.00%
% Area	6.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	<i>j</i> 9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	, 0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10480

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	attenting along
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	15.6	
Sub Total	0.0	56,826.3	15.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	4.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	19.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10480

Building Sq.Ft.: System Type

28,057

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-4

Typical Building Information

Typical building information								
Category	Construction	Use	Occ.	Day				
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		20000
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC		0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC		9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
. ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR		9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

05-Apr-95 DATE:

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10480

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	***************************************
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	15.6	7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7
Sub Total	0.0	56,826.3	15.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	4.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	19.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10480

Building Sq.Ft.:

28,057

1

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-5

Typical Building Information

	Typical building information								
Category	Construction	Use	Occ.	Day					
	18 BRICK	VEH MNT SHOP	0700-1900	SUN-SAT					

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

S	М	Т	W	TH	F	S
0	700	700	700	700	700	700
0	1600	1600	1600	1600	1600	1600
	S 0	0 700	0 700 700	0 700 700 700	0 700 700 700 700	0 700 700 700 700 700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10000
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+Ó0	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

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05-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10480

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.8	
Sub Total	0.0	56,826.3	7.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	9.8	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10480

Building Sq.Ft.: System Type

28,057

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU6

Typical Building Information

Typical building information						
Category	Construction	Use	Occ.	Day		
	8 BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16100
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.	:	0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	to a first the second of the first of the first
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

		1845417
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00
DSC NSC FV CHWR OAR	2.36E+03 9.26E+03 0 9.57 7.40	2.36E+0 9.26E+0 9.5 7.4

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

05-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10480

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	13.0	
Sub Total	0.0	56,826.3	13.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	Adding a supplied of
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	16.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10480

DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

28,057

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-7

Typical Building Information

Γ	Category		Construction	Use	Occ.	Day
		18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	7.5
Load Factor	0.8
CFM - HTG	16100
CFM - CLG	0
% OA	100.00%
% Area	2.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 83	3.10% 83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10480

System Type

4

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	28,632.0	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	5.2	
Sub Total	0.0	29,644.0	5.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	29,644.0	6.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10480

DATE:

05-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

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EMC NO.: 1406-006

Building Sq.Ft.:

28,057

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HTP1

Typical Building Information

	. , , , , , , , , , , ,			
Category	Construction	Use	Occ.	Day
18		VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	5
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	24.00%
TON CAPC.	0
MBTU CAPC.	3.587
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 8	1.60% 81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	Commence in the Commence of th
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

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Bldg Number:

10480

System Type System Name:

BASEBOARD RADIATION

System Number:

HTP1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	62.3	
Sub Total	0.0	12,616.7	62.3	· · · · · · · · · · · · · · · · · · ·
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	15.9	
HW OA Reset	0.0	0.0	26.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	104.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10480

DATE: 05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

28,057

System Type

System Name:

CONVERTER AND PUMPS

System Number: HTP2

Typical Building Information

.,,,									
Category	Category Construction		Occ.	Day					
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT					

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	5
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	4.62
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Bldg Number:

10480

System Type
System Name: CO

CONVERTER AND PUMPS

System Number: HTP2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	34.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	34.2	3

Date:

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PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10480

Building Sq.Ft.:

28,057

9

System Name:

CONVERTER AND PUMPS

System Number:

System Type

HTP3

Typical Building Information

	Typical building information									
Category	Category Construction		Use	Occ.	Day					
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT					

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.258
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

	1007/100	IN DUT
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

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05-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10480

System Type System Name:

CONVERTER AND PUMPS

System Number:

HTP3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	31.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	, , , , , , , , , , , , , , , , , , ,
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	31.5	3

ENERGY CALCULATIONS

BUILDING 10500

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10500

DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

11,249

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

AHU1

Typical Building Information

	Typical Dananig Internation							
Category		Construction	Use	Occ.	Day			
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT			

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	. 0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		8.0
CFM - HTG		1230
CFM - CLG		0
% OA	100.00%	
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	1.0 27 (49 - 4/190-0-37 //)
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10500

System Type

.

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	147.6	
Sub Total	0.0	8,501.7	147.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,501.7	159.0	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10500

PAGE 1 OF 2

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

05-Apr-95

Building Sq.Ft.:

11,249

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

Typical Building Information

Typical Dullaning Information							
Category	Construction	Use	Occ.	Day			
1	BRICK	BN HQ BLDG	0600-1700	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	1
Load Factor	0.8
CFM - HTG	210
CFM - CLG	0
% OA	100.00%
% Area	4.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 69.20	% 69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	Marie Contract Delic Particle As 1999
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HŘSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10500

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	28.1	7 - W W
Sub Total	0.0	4,791.4	28.1	p. (4.10)
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,791.4	30.3	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY** BLDG:

LOCATION: FT. DRUM

12,450

10500

Building Sq.Ft.: System Type

9

System Name:

CONVERTER AND PUMPS

System Number:

HE1

Typical Building Information

Typical building information						
Category	Construction	Use	Occ.	Day		
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HŘSAV	5,371	

CONSTANT	I OOK-LIB	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
		0.00E+00
COAOC	0.00E+00	
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10500

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,328.6	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,328.6	1.9	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10500

04-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

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EMC NO.: 1406-006

Building Sq.Ft.:

11,249

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

Typical Building Information

Typical Danting Internation									
Category	Category Construction		Use	Occ.	Day				
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HŘSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10500

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	**************************************
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	527.0	
Sub Total	0.0	2,397.8	527.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	40.9	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,397.8	568.7	3

ENERGY CALCULATIONS

BUILDING 10502

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10502

DATE:

31-Mar-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

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Building Sq.Ft.:

18,199

System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

Typical Building Information

	Typical Ballaning throttination									
	Category Construction		Use	Occ.	Day					
Ī	12	BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT					

2

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	Т	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1600	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
· % Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.8216
kW/Ton		0
MOSON		7
EFF		0.8
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,540	3,360
Heating HRSON	2,464	5,376
C/H HRSON	4,015	8,760
Cooling HRSAV	1,820	
Heating HRSAV	2,912	
C/H HRSAV	4,745	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
HOAOH	46.22	46.22
HOAOHC	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	2.98E-04	2.98E-04
ECHC	1.14E-04	1.14E-04
NSUCC	2.13E-03	2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+04	1.18E+04
NSC	3.21E+04	3.21E+04
FV	64	64
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10502

System Type

System Name:

HOT WATER BOILER AND PUMPS

System Number:

B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,453.7	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	4,741.3	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.6	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,741.3	7.6	2 a maria 3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10502

Building Sq.Ft.:

18,199 10

System Type **HOT WATER BOILER AND PUMPS** System Name:

System Number:

B2

	Typical Building Information						
Category		Construction	Use	Occ.	Day		
	12	BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT		

Enter Weeks of Summer: Enter Weeks of Winter:

Etitet Meeks of Militer.	02

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1600	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	w	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.8216
kW/Ton		0
MOSON		7
EFF		0.8
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,540	3,360
Heating HRSON	2,464	5,376
C/H HRSON	4,015	8,760
Cooling HRSAV	1,820	
Heating HRSAV	2,912	
C/H HRSAV	4,745	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
HOAOH	46.22	46.22
HOAOHC	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	2.98E-04	2.98E-04
ECHC	1.14E-04	1.14E-04
NSUCC		2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+04	1.18E+04
NSC	3.21E+04	3.21E+04
FV	64	64
CHWR		9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

31-Mar-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10502

System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

B2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,453.7	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	4,741.3	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.6	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,741.3	7.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

BLDG:

10502

DATE:

31-Mar-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

LOCATION: FT. DRUM

18,199

Building Sq.Ft.: System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

Typical Building Information

Typical Danamy Michigan								
Category	Construction	Use	Occ.	Day				
	2 BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1600	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.8216
kW/Ton	0
MOSON	7
EFF	0.8
LOOK-UP VALUE	
EFFHP 78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	Proceedings of the process of the contract of
Cooling HRSON	1,540	3,360
Heating HRSON	2,464	5,376
C/H HRSON	4,015	8,760
Cooling HRSAV	1,820	
Heating HRSAV	2,912	
C/H HRSAV	4,745	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
HOAOH	46.22	46.22
HOAOHC	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	2.98E-04	2.98E-04
ECHC	1.14E-04	1.14E-04
NSUCC	2.13E-03	2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+04	1.18E+04
NSC	3.21E+04	3.21E+04
FV	64	64
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10502

System Type

System Name:

HOT WATER BOILER AND PUMPS

System Number:

B3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,453.7	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	4,741.3	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.6	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,741.3	7.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

9

10502

BLDG:

Building Sq.Ft.:
System Type

18,199

System Name:

SINGLE ZONE AHU

System Number:

AHU1

	Typical Building Information							
Category		Construction	Use	Occ.	Day			
	12	BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1600	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	w	TH	F	S
Start Time	600	600	600	600	600	600	600
Stop Time	2100	2100	2100	2100	2100	2100	2100

INPUTS	INPUT
Motor HP	3.1
Load Factor	0.8
CFM - HTG	2500
CFM - CLG	2500
% OA	35.00%
% Area	15.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,540	2,100
Heating HRSON	2,464	3,360
C/H HRSON	4,015	5,475
Cooling HRSAV	560	
Heating HRSAV	896	
C/H HRSAV	1,460	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
HOAOH	46.22	46.22
HOAOHC	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	2.98E-04	2.98E-04
ECHC	1.14E-04	1.14E-04
NSUCC	2.13E-03	2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+04	1.18E+04
NSC	3.21E+04	3.21E+04
FV	64	0
CHWR	9.57	9.57
OAR		7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

31-Mar-95

DATE:

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10502

System Type

System Name:

SINGLE ZONE AHU

System Number:

AHU1

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,186.8	0.0	-
Optimum ST/SP	0.0	440.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	4.7	0.0	0.0	
Night Setback	0.0	0.0	87.5	-
Sub Total	4.7	8,626.8	87.5	
Economizer	0.0	1,146.5	0.0	
Ventilation/Recirculation	0.0	614.2	0.0	
DDC Control	0.0	0.0	32.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		-		
Run Time, and Safety Alarms				3
TOTAL	4.7	10,387.5	119.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10502

31-Mar-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

18,199

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

BLDG:

AHU2 System Number:

Typical Building Information

. , , , , , , , , , , , , , , , , , , ,								
Category		Construction	Use	Occ.	Day			
	12	BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1600	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	600	600	600	600	600	600	600
Stop Time	1500	1500	1500	1500	1500	1500	1500

INPUTS	INPUT
Motor HP	7.5
Load Factor	0.8
CFM - HTG	4500
CFM - CLG	4500
% OA	35.00%
% Area	26.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 83.10°	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,540	1,260
Heating HRSON	2,464	2,016
C/H HRSON	4,015	3,285
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
HOAOH	46.22	46.22
HOAOHC	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	2.98E-04	2.98E-04
ECHC	1.14E-04	1.14E-04
NSUCC		2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC		1.18E+04
NSC	3.21E+04	3.21E+04
FV	0	64
CHWR		9.57
OAR	7.40	. 7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10502

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

AHU2

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	10.8	0.0	0.0	
Night Setback	0.0	0.0	151.7	
Sub Total	10.8	1,012.1	151.7	
Economizer	0.0	2,063.7	0.0	
Ventilation/Recirculation	0.0	1,105.5	22.5	
DDC Control	0.0	0.0	56.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	10.8	4,181.3	230.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

31-Mar-95

DATE:

PAGE 1 OF 2

Building Sq.Ft.:

18,199

10502

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

AHU3

Typical Building Information

Typical Building Information								
Category	Construction	Use	Occ.	Day				
	2 BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1600	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	600	600	600	600	600	600	600
Stop Time	2100	2100	2100	2100	2100	2100	2100

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		6100
CFM - CLG		6100
% OA		35.00%
% Area		36.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,540	2,100
Heating HRSON	2,464	3,360
C/H HRSON	4,015	5,475
Cooling HRSAV	560	
Heating HRSAV	896	
C/H HRSAV	1,460	

Milian i	CONSTANT	LOOK-UP	INPUT
154.4 A	HOAUH	0.00	0.00
	HOAUHC	0.00	0.00
	COAUC	9.73E-03	9.73E-03
	COAUHC	3.73E-03	3.73E-03
	HOAOH	46.22	46.22
	HOAOHC	28.36	28.36
	COAOC	5.73E-03	5.73E-03
	COAOHC	2.20E-03	2.20E-03
	DC DUTY	0.00	0.00
	DC DEMAN	0.17	0.17
	ECC	2.98E-04	2.98E-04
	ECHC		1.14E-04
	NSUCC	2.13E-03	2.13E-03
	NSUCHC	1.31E-03	1.31E-03
	DDCCHC	0.00E+00	0.00E+00
	DDCCC	0.00E+00	0.00E+00
	DSC		1.18E+04
	NSC	3.21E+04	3.21E+04
	FV	64	0
	CHWR		9.57
	OAR	7.40	7.40
	OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10502

System Type System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

AHU3

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	19,497.3	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	10.8	0.0	0.0	
Night Setback	0.0	0.0	210.0	
Sub Total	10.8	20,509.4	210.0	
Economizer	0.0	2,797.5	0.0	
Ventilation/Recirculation	0.0	1,498.5	0.0	
DDC Control	0.0	0.0	77.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	10.8	24,805.4	287.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10502

EMC NO.: 1406-006

31-Mar-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

18,199

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

AHU4

Typical Building Information

. y proc. 2 and 3										
Category	Construction	Use	Occ.	Day						
1	2 BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT						

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1600	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	600	600	600	600	600	600	600
Stop Time	2100	2100	2100	2100	2100	2100	2100

INPUTS	INPUT
Motor HP	7.5
Load Factor	0.8
CFM - HTG	4000
CFM - CLG	4000
% OA	35.00%
% Area	23.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,540	2,100
Heating HRSON	2,464	3,360
C/H HRSON	4,015	5,475
Cooling HRSAV	560	
Heating HRSAV	896	
C/H HRSAV	1,460	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
HOAOH	46.22	46.22
HOAOHC	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	2.98E-04	2.98E-04
ECHC	1.14E-04	1.14E-04
NSUCC	2.13E-03	2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+04	1.18E+04
NSC	3.21E+04	3.21E+04
FV	64	64
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10502

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

AHU4

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	15,490.9	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	10.8	0.0	0.0	
Night Setback	0.0	0.0	134.2	
Sub Total	10.8	16,503.0	134.2	
Economizer	0.0	1,834.4	0.0	
Ventilation/Recirculation	0.0	982.6	20.0	
DDC Control	0.0	0.0	49.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		<u> </u>		
Run Time, and Safety Alarms				3
TOTAL	10.8	19,320.0	203.7	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM BLDG:

Building Sq.Ft.:

18,199

10502

System Type

8

System Name:

CHILLER AND PUMPS

System Number:

WC1

Typical Building Information

	. , p			
Category	Construction	Use	Occ.	Day
	2 BRICK	EXCHANGE/CLUB	0800-300	SUN-SAT

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1600	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		73
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		0.8
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,540	3,360
Heating HRSON	2,464	5,376
C/H HRSON	4,015	8,760
Cooling HRSAV	1,820	
Heating HRSAV	2,912	
C/H HRSAV	4,745	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	9.73E-03	9.73E-03
COAUHC	3.73E-03	3.73E-03
HOAOH	46.22	46.22
HOAOHC	28.36	28.36
COAOC	5.73E-03	5.73E-03
COAOHC	2.20E-03	2.20E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	2.98E-04	2.98E-04
ECHC	1.14E-04	1.14E-04
NSUCC	2.13E-03	2.13E-03
NSUCHC	1.31E-03	1.31E-03
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+04	1.18E+04
NSC	3.21E+04	3.21E+04
FV	64	64
CHWR	9.57	9.57
OAR		· 7.40
OPT	188.00	188.00

EMC NO.: 1406-006

DATE: 31-Mar-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

System Type

System Name:

CHILLER AND PUMPS

System Number:

WC1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	9,797.8	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	10.8	0.0	0.0	
Night Setback	0.0	0.0	0.0	then as a sa
Sub Total	10.8	10,809.9	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	698.6	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	10.8	11,508.5	0.0	3

ENERGY CALCULATIONS

BUILDING 10506

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10506

DATE:

EMC NO.: 1406-006

30-Mar-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

18,386

Building Sq.Ft.: System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

AHU1 System Number:

Typical Building Information

Typical Bullating Information								
Category		Construction	Use	Occ.	Day			
	13	BRICK	CLINIC W/O BEDS	0700-1600	MON-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

S	M	T	W	TH	F	S
0	700	700	700	700	700	700
0	1600	1600	1600	1600	1600	1600
	S 0	S M 700	0 700 700	0 700 700 700	0 700 700 700 700	0 700 700 700 700 700

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		9300
CFM - CLG		11500
% OA		100.00%
% Area		15.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		0.78
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.11E-03	2.11E-03
COAUHC	8.08E-04	8.08E-04
HOAOH	227.68	227.68
HOAOHC	139.72	139.72
COAOC	3.35E-03	3.35E-03
COAOHC	1.29E-03	1.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	2.77E-04	2.77E-04
NSUCHC	1.70E-04	1.70E-04
DDCCHC	1.32E-04	1.32E-04
DDCCC	3.44E-04	3.44E-04
DSC	3.81E+03	3.81E+03
NSC	2.59E+04	2.59E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

30-Mar-95 PAGE 2 OF 2

Bldg Number:

10506

System Type

3

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

AHU1

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	78,056.1	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	10.8	0.0	0.0	
Night Setback	0.0	0.0	71.5	
Sub Total	10.8	79,068.1	71.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	13,613.8	10.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	10.8	92,682.0	82.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10506

DATE:

30-Mar-95 PREPARED BY: CSW/BMG

PAGE 1 OF 2

EMC NO.: 1406-006

CHECKED BY: KC/WLC

Building Sq.Ft.:

18,386

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE2

Typical Building Information

	Typical Danaing Information								
Category Constructio			Use	Occ.	Day				
Ī	13	BRICK	CLINIC W/O BEDS	0700-1600	MON-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT			
Motor HP	Motor HP				
Load Factor		0.8			
CFM - HTG		0			
CFM - CLG		0			
% OA		0.00%			
% Area		0.00%			
TON CAPC.		0			
MBTU CAPC.		0.1836			
kW/Ton		0			
MOSON		7			
EFF		1			
LOOK-UP VALUE					
EFFHP	69.20%	69.20%			

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.11E-03	2.11E-03
COAUHC	8.08E-04	8.08E-04
HOAOH	227.68	227.68
HOAOHC	139.72	139.72
COAOC	3.35E-03	3.35E-03
COAOHC	1.29E-03	1.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	2.77E-04	2.77E-04
NSUCHO	1.70E-04	1.70E-04
DDCCHC	1.32E-04	1.32E-04
DDCCC	3.44E-04	3.44E-04
DSC	3.81E+03	3.81E+03
NSC	2.59E+04	2.59E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

30-Mar-95 PAGE 2 OF 2

Bldg Number: System Type 10506

System Name:

CONVERTER AND PUMPS

System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,813.5	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	2,975.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.4	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,975.5	1.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10506

DATE:

30-Mar-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

18,386

System Type

12

System Name:

BASEBOARD RADIATION

System Number: HE1

Typical Building Information

	i ypicai D	anding mioniation		
Category	Construction	Use	Occ.	Day
1	3 BRICK	CLINIC W/O BEDS	0700-1600	MON-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Ston Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	1 点 电	INPUT			
Motor HP		0.75			
Load Factor		0.8			
CFM - HTG		0			
CFM - CLG		0			
% OA		0.00%			
% Area		85.00%			
TON CAPC.		0			
MBTU CAPC.		0.46			
kW/Ton		0			
MOSON		7			
EFF		1			
LOOK-UP VALUE					
EFFHP	65.00%	65.00%			

HOURS	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.11E-03	2.11E-03
COAUHC	8.08E-04	8.08E-04
HOAOH	227.68	227.68
HOAOHC	139.72	139.72
COAOC	3.35E-03	3.35E-03
COAOHC	1.29E-03	1.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	2.77E-04	2.77E-04
NSUCHC	1.70E-04	1.70E-04
DDCCHC	1.32E-04	1.32E-04
DDCCC	3.44E-04	3.44E-04
DSC	3.81E+03	3.81E+03
NSC	2.59E+04	2.59E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

30-Mar-95 PAGE 2 OF 2

Bldg Number:

10506

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,246.4	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	405.4	
Sub Total	0.0	2,375.8	405.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	59.6	
HW OA Reset	0.0	0.0	3.4	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,375.8	468.3	3 , 1

ENERGY CALCULATIONS

BUILDING 10510

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10510

PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

05-Apr-95

PAGE 1 OF 2

DATE:

Building Sq.Ft.:

System Type

12,450

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

	Typical Danamy mornios									
Category Construction		Use	Occ.	Day						
	1	7 BRICK	BN HQ BLDG	0600-1700	SUN-SAT					

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	1230
CFM - CLG	0
% OA	100.00%
% Area	21.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 7	8.00% 78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HŘSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10510

System Type
System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	•
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	163.3	
Sub Total	0.0	8,501.7	163.3	***************************************
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,	1			
Run Time, and Safety Alarms				3
TOTAL	0.0	8,501.7	176.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10510

EMC NO.: 1406-006 DATE: 05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

12,450

System Type

System Name:

Stop Time

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

Typical Building Information

Typical Datients									
Category Construction		Use	Occ.	Day					
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT					

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	9	M	т	w	TH	F	s
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10510

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	<u> </u>
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	31.1	
Sub Total	0.0	4,791.4	31.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.4	
HW OA Reset	0.0	0.0	. 0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,791.4	33.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10510

EMC NO.: 1406-006

DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

1

System Type

12,450

System Name:

CONVERTER AND PUMPS

System Number:

HE1

Typical Building Information

	Typious 22 many								
	Category	Construction	Use	Occ.	Day				
Ì	1	7 BRICK	BN HQ BLDG	0600-1700	SUN-SAT				

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+Q0	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10510

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	•
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,328.6	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,328.6	1.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10510

04-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

12,450

System Type

12

System Name:

BASEBOARD RADIATION

HE2 System Number:

Typical Building Information

Category Co		Construction	Use	Occ.	Day
<u> </u>	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT
	• •				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT				
Motor HP		0.75				
Load Factor		0.8				
CFM - HTG		0				
CFM - CLG						
% OA		0.00%				
% Area		75.00%				
TON CAPC.		0				
MBTU CAPC.		0.1117				
kW/Ton		0				
MOSON		7				
EFF		1				
LOOK-UP VALUE						
EFFHP	65.00%	65.00%				

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10510

System Type

12 **BASEBOARD RADIATION**

System Name: System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/vr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	583.3	
Sub Total	0.0	2,397.8	583.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,397.8	629.3	3

ENERGY CALCULATIONS

BUILDING 10512

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

Building Sq.Ft.:

52,266

10,512

System Type

System Name:

CONVERTER AND PUMPS

System Number: HE-1

Typical Building Information

Typical building information							
Category		Construction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT				
Motor HP		2				
Load Factor	Load Factor					
CFM - HTG						
CFM - CLG	CFM - CLG					
% OA		0.00%				
% Area		0.00%				
TON CAPC.		0				
MBTU CAPC.		0.5123				
kW/Ton		0				
MOSON		7				
EFF		1				
LOOK-UP VALUE						
EFFHP	78.00%	78.00%				

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONCTANT	LOOKUD	A INTOLET
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

PAGE 1 OF 2

01-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number: System Type

10,512

9

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	3.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	3.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10,512

Building Sq.Ft.:

52,266 12

System Type System Name:

BASEBOARD RADIATION

System Number:

HE-2

Typical Building information					
Category		Construction	Use	Occ.	Day
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	10.660	INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.9801
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

LOOK HD	INPUT
	0.00
	0.00
	0.00E+00
0.00E+00	0.00E+00
220.75	220.75
110.07	110.07
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00	0.00
0.17	0.17
0.00E+00	0.00E+00
5.84E+03	5.84E+03
4.86E+04	4.86E+04
0	0
9.57	9.57
7.40	7.40
188.00	0.00
	0.00E+00 0.00E+00 220.75 110.07 0.00E+00 0.00E+00 0.17 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 3.84E+03 4.86E+04 0 9.57 7.40

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

01-Apr-95

DATE:

PAGE 1 OF 2

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bidg Number:

10,512

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	,
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	,
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,			***************************************	- A-L
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	7.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

===

10512

EMC NO.: 1406-006

DATE: 12-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

17,770

System Type

14

System Name: System Number: VENTILATION

ystem Number: AHU-1

Typical Building Information

		. , p			
Category		Construction	Use	Occ.	Day
	14	BRICK	ADM & SUPPLY,ENL BRK V	0600-1700	MON-FRI

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	
Load Factor	3.0
CFM - HTG	(
CFM - CLG	4779
% OA	100.00%
% Area	0.00%
TON CAPC.	
MBTU CAPC.	
kW/Ton	
MOSON	
EFF	
LOOK-UP VALUE	
	00% 79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number:

10512

System Type

14

System Name:

VENTILATION

System Number: AHU-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10512

EMC NO.: 1406-006

DATE:

12-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

17,770

System Type

14

System Name:

VENTILATION

System Number:

AHU-2

Typical Building Information

		i ypioai c	unung miorimanon		
Category		Construction	Use	Occ.	Day
<u> </u>	14	BRICK	ADM & SUPPLY, ENL BRK V	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number:

10512

System Type

14

System Name: System Number: **VENTILATION** AHU-2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10512

EMC NO.: 1406-006

DATE: 01-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

17,770

14

System Type System Name:

VENTILATION

System Number:

AHU3

Typical Building Information

	Category	Construct	ion Use	Occ.	Day	
1		14 BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI	

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	Ō	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	1.45.484	INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4566
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS	REQUIRED	PRESENT
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10512

System Type System Name: 14 VENTILATION

System Number:

AHU3

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10512

12-Apr-95 DATE:

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

17,770

Building Sq.Ft.: System Type

14

System Name:

VENTILATION

System Number:

AHU-4

Typical Building Information							
Category	Construction	Use	Occ.	Day			
14	BRICK	ADM & SUPPLY ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	3
Load Factor	0.8
CFM - HTG	4779
CFM - CLG	0
% OA	100.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	5
EFF	1_
LOOK-UP VALUE	
EFFHP 79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	0.0000000000000000000000000000000000000
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number:

10512

System Type

14 VENTILATION

System Name: System Number:

AHU-4

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,	·			
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10512

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

02-Apr-95

PAGE 1 OF 2

Building Sq.Ft.:

17,770

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

Typical Building Information

	Category	Construction	Use	Occ.	Day
ı	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT				
Motor HP	0.33					
Load Factor		0.8				
CFM - HTG		750				
CFM - CLG		0				
% OA	100.00%					
% Area	12.75%					
TON CAPC.		0				
MBTU CAPC.		0				
kW/Ton		0				
MOSON	MOSON					
EFF		1				
LOOK-UP VALUE						
EFFHP	65.00%	65.00%				

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bidg Number:

10512

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	110.2	
Sub Total	0.0	1,683.3	110.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	123.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10512

DATE:

02-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

17,770

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU7

Typical Building Information

Typical Building information							
Category		Construction Use		e Occ.			
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20

Required Operation	S	М	T	W	H	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10512

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	110.2	
Sub Total	0.0	1,683.3	110.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	123.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10512

DATE:

02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

17,770

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

8UHA

Typical Building Information

Typical Danoing						
Category	Construction	Use	Occ.	Day		
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	 600 Manths of the 6,666
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10512

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

8UHA

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	110.2	
Sub Total	0.0	1,683.3	110.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	123.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10512

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

17,770

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

Typical Building Information

Typical Daniening					
Category	Construction	Use	Occ.	Day	
	14 BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI	

Enter Weeks of Summer:

20
 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	750
CFM - CLG	0
% OA	100.00%
% Area	12.75%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 6	5.00% 65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	A Continue of the continue of
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10512

System Type

•

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	110.2	
Sub Total	0.0	1,683.3	110.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	123.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10512

EMC NO.: 1406-006 DATE: 02-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

3<u>4,</u>496

System Type

1

System Type
System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU10

Typical Building Information

Typical Dallating Information						
Category	Construction	Use	Occ.	Day		
1	5 BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT		

Enter Weeks of Summer:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.5
Load Factor	0.8
CFM - HTG	1860
CFM - CLG	0
% OA	100.00%
% Area	19.30%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC		1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR		9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10512

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	80.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	0.0	80.7	

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

02-Apr-95

10512

Building Sq.Ft.:

34,496

System Type

System Name: System Number: **H&V UNIT WITHOUT RETURN FAN**

AHU11

Typical Building Information

.) prout = une g						
Category	Construction	Use	Occ.	Day		
	5 BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT		

Enter Weeks of Summer:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W_	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1350
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10232

System Type

10232

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	-
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	80.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	0.08	3

ENERGY CALCULATIONS

BUILDING 10514

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10,514

Building Sq.Ft.:

45,719

System Type System Name:

System Number:

CONVERTER AND PUMPS

HE-1

Typical Building Information

Typical Building Information						
Category Construction		Use	Occ.	Day		
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	Т	W	TH	F F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.3875
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOKID	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	· 7.40
OPT	188.00	188.00
	. 50.00	100.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

01-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,514

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	2.9	31.

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

45,719

10,514

Building Sq.Ft.: System Type

System Name:

12 **BASEBOARD RADIATION**

System Number:

HE-2

Typical Building Information

	Typical Building information								
Category	С	onstruction	Use	Occ.	Day				
	14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F_	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.75
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.6683
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONCTANT	LOOK-UP	INPUT
CONSTANT		
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

01-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,514

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	WATER TO THE PARTY OF THE PARTY
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	4.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10514

02-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

11,430

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

Typical Building Information							
Category		Construction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	Ť	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10514

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	94.5	
Sub Total	0.0	1,683.3	94.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	105.9	3.77

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

Building Sq.Ft.:

11,430

10514

PAGE 1 OF 2

DATE:

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

02-Apr-95

EMC NO.: 1406-006

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU2

Typical Building Information

Typical Danaing information						
Category	Construction	Use	Occ.	Day		
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA	100.00%	
% Area	17.00%	
TON CAPC.	0	
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

LOOK-UP	INPUT
0.00	0.00
0.00	0.00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
220.75	220.75
110.07	110.07
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00	0.00
0.17	0.17
0.00E+00	0.00E+00
5.84E+03	5.84E+03
4.86E+04	4.86E+04
0	0
9.57	9.57
7.40	7.40
188.00	188.00
	0.00 0.00E+00 0.00E+00 220.75 110.07 0.00E+00 0.00E 0.17 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 7.84E+03 4.86E+04 0 9.57 7.40

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10514

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	94.5	
Sub Total	0.0	1,683.3	94.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL OF A SAME THAT IS NOT A	0.0	1,683.3	105.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10514

DATE:

02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

11,430

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU4

Typical Building Information

Typical Danama members							
Category Constr		Construction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10514

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	94.5	
Sub Total	0.0	1,683.3	94.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	105.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10514

Building Sq.Ft.:
System Type

34,289

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU5

Typical Building Information

Typical Building Information							
Category		Construction	Use	Occ.	Day		
	15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	<u> </u>	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT					
Motor HP		0.33					
Load Factor		0.8					
CFM - HTG		1300					
CFM - CLG		0					
% OA	% OA						
% Area		16.70%					
TON CAPC.		0					
MBTU CAPC.		0					
kW/Ton		. 0					
MOSON		12					
EFF		1					
LOOK-UP VALUE							
EFFHP	65.00%	65.00%					

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

		MON 11 12 20 12 1
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

01-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10514

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	81.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
Common TOTAL	0.0	0.0	81.7	**************************************

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10514

Building Sq.Ft.: System Type

34,289

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

Typical Building Information

	Typical Ballang Information									
ĺ	Category Construction		Use	Occ.	Day					
	15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT					

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1060
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	I OOK-LIP	INPUT
		0.00
HOAUH	0.00	
HOAUHC	0.00	0.00
COAUC		0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

01-Арг-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10514

System Type

.

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	81.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	0.0	81.7	

ENERGY CALCULATIONS

BUILDING 10520

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10520

05-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

12,450

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

Typical Ballanig Information										
Category		Construction	Use	Occ.	Day					
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT					

32

Enter Weeks of Summer: Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	1230
CFM - CLG	0
% OA	100.00%
% Area	21.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

10520

Bldg Number: System Type

....

System Type
System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	163.3	
Sub Total	0.0	8,501.7	163.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,501.7	176.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10520

EMC NO.: 1406-006

DATE: 05-Apr-95

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

12,450

System Type

•

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

Typical Building Information

.yp.ou. zunzug mermen								
Category Construction		Use	Occ.	Day				
1	7 BRICK	BN HQ BLDG	0600-1700	SUN-SAT				

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	1	
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	STANDARD STANDARD STANDARD STANDARD STANDARD STANDARD STANDARD STANDARD STANDARD STANDARD STANDARD STANDARD ST
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HŘSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10520

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	31.1	
Sub Total	0.0	4,791.4	31.1	1- Dr
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,791.4	33.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

12,450

10520

DATE: 04-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type

System Name: System Number: **CONVERTER AND PUMPS** HE1

Typical Building Information

.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
Category	Construction	Use	Occ.	Day			
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT			

20 32

Enter Weeks of Summer: Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10520

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,328.6	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	***************************************
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,328.6	1.9	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10520

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

04-Apr-95

Building Sq.Ft.: System Type

12,450 12

System Name:

BASEBOARD RADIATION

System Number:

Typical Building Information

Typious Duttaing information							
Category	C	onstruction	Use	Occ.	Day		
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT		

Enter Weeks of Summer:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10520

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	583.3	
Sub Total	0.0	2,397.8	583.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,397.8	629.3	3

ENERGY CALCULATIONS

BUILDING 10522

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10,522

01-Apr-95 PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

43,886

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

Typical Building Information

	Typical Ballating intermation							
ſ	Category Construc		Use	Occ.	Day			
ľ	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA	0.00%	
% Area	0.00%	
TON CAPC.		0
MBTU CAPC.		0.3875
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC		5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR		9.57
OAR		7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,522

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	2.9	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10522

DATE:

01-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

43,886

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

Typical Building Information

Typical Ballang Information						
Category	Category Construction		Use	Occ.	Day	
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI	

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.75
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.6683
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10522

System Type

11

System Name:

BASEBOARD RADIATION

System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	129.4	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	129.4	4.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10522

DATE:

02-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

10,972

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

Typical Dallang Internation							
Category	Construction	Use	Occ.	Day			
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT			
Motor HP		0.33			
Load Factor	Load Factor				
CFM - HTG	770				
CFM - CLG	0				
% OA	100.00%				
% Area		17.00%			
TON CAPC.		0			
MBTU CAPC.		0			
kW/Ton		0			
MOSON		12			
EFF		1			
LOOK-UP VALUE					
EFFHP	65.00%	65.00%			

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10522

System Type

.

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	90.7	
Sub Total	0.0	1,683.3	90.7	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	101.6	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10522

DATE: 02-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

10,972

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU2

Typical Building Information

Typical Danaing Information							
Category	Construction	Use	Occ.	Day			
	4 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV .	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10522

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	90.7	
Sub Total	0.0	1,683.3	90.7	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	· 0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,	·			
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	101.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10522

02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

10,972

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU4

Typical Building Information

	. yprot untrig							
Category Construction		Use	Occ.	Day				
İ	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700		1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	0.33	
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton	-	0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10522

System Type

IOOLL

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	90.7	
Sub Total	0.0	1,683.3	90.7	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	101.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10522

DATE: 01-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

32,915

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU5

Typical Building Information

	Typical Datitudg Internation							
i	Category	Construction	Use	Occ.	Day			
ì	15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT			

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	1300
CFM - CLG	0
% OA	100.00%
% Area	16.70%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bidg Number:

10522

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	78.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	0.0	78.4	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10522

DATE: 01-Арг-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

32,915

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

AHU6 System Number:

Typical Building Information

Typica: Danien g time to the control of the control							
Category	Construction	Use	Occ.	Day			
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT			

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1060
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	March 1995 Anna Carlotte (1995)
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV.	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10522

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	*****
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	78.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	78.4	3

ENERGY CALCULATIONS

BUILDING 10524

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10,524

2400

2400

Building Sq.Ft.:

45,746

System Type

System Name:

CONVERTER AND PUMPS

System Number:

Start Time

Stop Time

HE-1

Typical Building Information

	Typical Building information									
	Category	Construction	Use	Occ.	Day					
ĺ	14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI					

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

2400

Required Operation	S	M	Т	W	TH	
Start Time	0	0	0	0	0	

2400

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

2400

INPUTS	dati d		INPUT			
Motor I	Motor HP					
Load Fac	tor		0.8			
CFM - HT	rg		0			
CFM - CL	.G		0			
% (DΑ		0.00%			
% Ar	% Area					
TON CAP	C.		0			
MBTU CAF	C.		0.3875			
kW/T	on		0			
MOS	ON		7			
E	FF		1			
LOOK-UP VALUE						
EFFI	-IP	78.00%	78.00%			

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR		7.40
OPT	188.00	188.00

0

2400

EMC NO.: 1406-006

DATE: 01-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

0

2400

PAGE 1 OF 2

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bidg Number:

10,524

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	- 10-10-10-10-1
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	2.9	3.3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10,524

DATE: 01-Apr-95 PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

45,746

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

Typical Building Information

Category	Construction	Use	Occ.	Day
1	4 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.75
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.6683
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 65	5.00% 65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	j

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,524

System Type

System Name:

BASEBOARD RADIATION

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	4.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10524

DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

11,437

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

Typical Dallang Internation								
Category		Construction	Use	Occ.	Day			
<u> </u>	14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20

32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Ston Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT				
Motor HP		0.33				
Load Factor		0.8				
CFM - HTG		770				
CFM - CLG		0				
% OA						
% Area	17.00%					
TON CAPC.		0				
MBTU CAPC.		0				
kW/Ton		0				
MOSON	MOSON					
EFF	1					
LOOK-UP VALUE	LOOK-UP VALUE					
EFFHP	65.00%	65.00%				

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10524

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	94.6	
Sub Total	0.0	1,683.3	94.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	105.9	3.1

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10524

Building Sq.Ft.: System Type

11,437

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

Start Time

Stop Time

AHU2

Typical Building Information

Typical Building information							
Category	Construction	Use	Occ.	Day			
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

600

1700

Required Operation	S	М	Т	W	TH

0

0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

600

1700

600

1700

600

1700

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	770
CFM - CLG	0
% OA	100.00%
% Area	17.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.009	% 65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	60000 November 200000 100000
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

	10.450
LOOK-UP	INPUT
0.00	0.00
0.00	0.00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
220.75	220.75
110.07	110.07
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00	0.00
0.17	0.17
0.00E+00	0.00E+00
5.84E+03	5.84E+03
4.86E+04	4.86E+04
0	0
9.57	9.57
7.40	7.40
188.00	188.00
	0.00 0.00E+00 0.00E+00 220.75 110.07 0.00E+00 0.00 0.17 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.584E+03 4.86E+04 0 9.57 7.40

600

1700

EMC NO.: 1406-006

02-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

0

0

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10524

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	<u> </u>
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	94.6	
Sub Total	0.0	1,683.3	94.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	0.000
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	105.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10524

DATE:

02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

11,437 System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: AHU4

Typical Building Information

Typical building information						
Category		Construction	Use	Occ.	Day	
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI	

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area	17.00%	
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE	-	
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bidg Number:

10524

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	94.6	
Sub Total	0.0	1,683.3	94.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	105.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10524

01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

34,310

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

AHU5

Typical Building Information

	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
ſ	Category Construction		Use	Occ.	Day			
Ī	15	Diviole	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT			

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	ruje i filozofica recenses (suific	INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PROPERTY OF STREET AND
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
НОАОНС	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10524

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	,
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	81.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	81.7	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10524

Building Sq.Ft.: System Type

34,310

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

Typical Building Information

Typical bullang information							
Category	Construction	Use	Occ.	Day			
15	BRICK	ADM & SUPPLY, ENL BRK		SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS			INPUT				
Moto	Motor HP						
Load I	Factor		0.8				
CFM -	HTG		1060				
CFM -	CLG		0				
	% OA		100.00%				
%	16.70%						
TON C	APC.		0				
MBTU (CAPC.		0				
k\	N/Ton		0				
MC	DSON		12				
	1						
LOOK-UP VALU	E						
El	FHP	65.00%	65.00%				

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

DATE: 01-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10524

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	,
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	81.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	81.7	3

ENERGY CALCULATIONS

BUILDING 10550

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10550

DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

15,560

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

AHU1

Typical Building Information

Typical Ballang Information							
Category		Construction	Use	Occ.	Day		
	16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

er weeks of winter.

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		8000
CFM - CLG		0
% OA		100.00%
% Area		17.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10550

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,789.6	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	174.4	
Sub Total	0.0	12,801.7	174.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	, , , , , , , , , , , , , , , , , , ,
DDC Control	0.0	0.0	63.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,801.7	237.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10550

EMC NO.: 1406-006

DATE: 06-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

15,560 2

System Type System Name:

H&V UNIT

System Number:

AHU2

Typical Building Information

	Typical Dunting Internation							
Category Construction		Use	Occ.	Day				
	16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT			

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	8
Load Factor	0.8
CFM - HTG	5265
CFM - CLG	0
% OA	25.00%
% Area	17.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 83.10%	83.10%

1 1 1 1 1 1 1 1 1 1	REQUIRED HR/YR	
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10550

06-Apr-95 PAGE 2 OF 2

Date:

Bldg Number:

System Type System Name:

2 **H&V UNIT**

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	14,042.8	0.0	
Optimum ST/SP	0.0	1,079.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	248.4	
Sub Total	0.0	15,122.3	248.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	89.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	A CONTRACTOR OF THE CONTRACTOR
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance, Run Time, and Safety Alarms				3
TOTAL	0.0	15,122.3	338.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

DATE: 06-Apr-95 PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC PAGE 1 OF 2

Building Sq.Ft.:

15,560

10550

System Type

2

System Name:

H&V UNIT

System Number:

AHU3

Typical Building Information

Typical Danially www.							
Category Construction		Use	Occ.	Day			
	16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT		

Enter Weeks of Summer:

20 32

Required Operation	S	M	Т	w	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		4670
CFM - CLG		0
% OA		100.00%
% Area		15.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	12000000 AN 1 LEVEL 5000
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10550

System Type

2

S

UNIT

System	Name:	H&V L
System	Number:	AHU3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	17,001.1	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	219.2	
Sub Total	0.0	18,308.0	219.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	79.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	18,308.0	298.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10550

EMC NO.: 1406-006

DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

15,560

System Type

2

System Name:

H&V UNIT

System Number:

AHU4

Typical Building Information

Typiou: Dullium g miles								
Category		Construction	Use		Occ.	Day		
	16	BRICK	ENK PERS DINNING		0400-2400	SUN-SAT		

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		7430
CFM - CLG		0
% OA		5.00%
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10550

System Type

System Name:

H&V UNIT

System Number:

AHU4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	25,236.9	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	350.7	
Sub Total	0.0	27,177.0	350.7	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	126.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	27,177.0	477.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10550

EMC NO.: 1406-006

DATE: 06-Арг-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

Building Sq.Ft.:

15,560

System Type

2

System Name:

H&V UNIT

System Number:

AHU5

Typical Building Information

Typious Dunaing interest						
Category	Construction	Use	Occ.	Day		
	6 BRICK	ENK PERS DINNING	0400-2400	SUN-SAT		

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	М	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		6
Load Factor		0.8
CFM - HTG		3145
CFM - CLG		0
% OA		5.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10550 2

System Type
System Name:

H&V UNIT

System Number:

AHU5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	10,725.7	0.0	
Optimum ST/SP	0.0	824.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	146.1	
Sub Total	0.0	11,550.2	146.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	52.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	- Control of the Cont
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	11,550.2	198.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10550

W

400

2000

TH

400

2000

DATE: 06-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

400

2000

400

2000

EMC NO.: 1406-006

Building Sq.Ft.:

15,560

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

AHU6 System Number:

Typical Building Information

Typiout management							
Category	Construction	Use	Occ.	Day			
	16 BRICK	ENK PERS DINNING	0400-2400	SUN-SAT			

Enter Weeks of Summer:

20

400

2000

M

En

Required Operation

Start Time

Stop Time

nter Weeks of Winter:	•	32	

S

400

2000

400

2000

Present Operations	5	īVI	l .	VV	ın	Г	
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400
				57.			

INPUTS		INPUT
Motor HP		4
Load Factor		0.8
CFM - HTG		600
CFM - CLG		0
% OA		0.00%
% Area		1.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10550

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,614.1	0.0	
Optimum ST/SP	0.0	567.8	0.0	A STATE OF THE STA
Duty Cycle	0.0	0.0	0.0	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	23.4	
Sub Total	0.0	7,181.9	23.4	
Economizer	0.0	0.0	0.0	***************************************
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	8.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	7,181.9	31.8	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10550

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

DATE:

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06-Apr-95

Building Sq.Ft.: System Type

15,560

System Name:

CONVERTER AND PUMPS

System Number:

HE1

Typical Building Information

Typical Building information							
Category	Construction	Use	Occ.	Day			
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT	-		

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		7.40%
TON CAPC.		0
MBTU CAPC.		1.5064
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

		13.55117
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10550

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,349.5	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	event.
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	108.1	
Sub Total	0.0	3,637.0	108.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	39.1	
HW OA Reset	0.0	0.0	11.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	, , , , , , , , , , , , , , , , , , , ,
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	3,637.0	158.3	3

ENERGY CALCULATIONS

BUILDING 10570

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10570

DATE: 04-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

25,827

System Type

2 **H&V UNIT**

System Name:

HV1

System Number:

Typical Building Information

Typical Building information								
Category	Construction	Use	Occ.	Day				
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		11135
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10570

System Type System Name:

H&V UNIT

System Number:

HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	23.9	
Sub Total	0.0	83,884.9	23.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	30.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10570

DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

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EMC NO.: 1406-006

Building Sq.Ft.: System Type 25,828

System Name:

H&V UNIT

System Number:

HV2

Typical Building Information

Typical Ballaning Internation						
Category	Construction Use		Occ.	Day		
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	27.5
Load Factor	0.8
CFM - HTG	11410
CFM - CLG	0
% OA	33.00%
% Area	10.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 89.40%	89.40%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10570

System Type System Name:

2

System Name: System Number: H&V UNIT HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	97,585.7	0.0	•
Optimum ST/SP	0.0	3,449.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	3
Night Setback	0.0	0.0	23.9	
Sub Total	0.0	101,035.1	23.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	101,035.1	30.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10570

EMC NO.: 1406-006

DATE: 04-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

25,827

System Type

2

System Name:

System Number:

H&V UNIT HV3

Typical Building Information

Typical Ballating Interniacion							
Category	Construction	Use	Occ.	Day			
1	8 BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	22.5
Load Factor	0.8
CFM - HTG	6020
CFM - CLG	0
% OA	33.00%
% Area	10.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 88.10	% 88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	Michigani in the second for the second
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10570

System Type System Name:

2 H&V UNIT

System Number:

HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	•
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	23.9	
Sub Total	0.0	83,884.9	23.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	-
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	30.0	30 Barrell (19 Barrell 19 PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10570

05-Apr-95 DATE: PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

25,827

System Type

Stop Time

System Name:

H&V UNIT

System Number:

HV4

Typical Building Information

Typical Ballating Illiania.								
Category	Construction	Use	Occ.	Day				
1	8 BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		4090
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR		9.57
OAR		7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10570

System Type

2

System Name:

H&V UNIT

System Number:

HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	12.0	
Sub Total	0.0	83,884.9	12.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	15.0	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10570

05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

25,827

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-1

Typical Building Information						
Category		Construction	Use	Occ.	Day	
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT	

Enter Weeks of Summer:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	Y 36 16 2		INPUT	
Moto	Motor HP			
Load F	actor		0.8	
CFM -	HTG		18150	
CFM -	CLG		0	
9	6 OA		100.00%	
%	Area		6.00%	
TON C	APC.		0	
MBTU C	APC.		0	
kV	V/Ton		O	
MC	SON		12	
	EFF		1	
LOOK-UP VALUE	:			
EF	FHP	86.70%	86.70%	

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10570

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	•
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	14.3	
Sub Total	0.0	56,826.3	14.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	18.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10570

DATE: 05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

25,827

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-2

Typical Building Information

Typical Bullating information								
Category		Construction	Use		Occ.	Day		
	18	BRICK	VEH MNT SHOP		0700-1900	SUN-SAT		

Enter Weeks of Summer:

20

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9200
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10570

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.2	
Sub Total	0.0	56,826.3	7.2	
Economizer	0.0	0.0	0.0	- Markey
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.8	***************************************
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	9.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10570

DATE: 05-Apr-95 PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

25,827

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: MAU-3

Typical Building Information

Typical Banang information								
Category		Construction	Use	Occ.	Day			
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	16920
CFM - CLG	0
% OA	100.00%
% Area	6.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
НОАОНС	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10570

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	14.3	
Sub Total	0.0	56,826.3	14.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	18.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10570

DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

25,827

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-4

Typical Building Information

	Typical Dunuing Information									
Category Construction		Construction	Use	Occ.	Day					
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT					

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS			INPUT		
Motor			15		
Load Fa	ctor		0.8		
CFM - H	ITG		20000		
CFM - C	LG		0		
%	OA		100.00%		
% A	% Area				
TON CA	PC.		0		
MBTU CA	PC.		0		
kW	Ton		0		
MOS	SON		12		
E	EFF		1		
LOOK-UP VALUE					
EFF	HP	86.70%	86.70%		

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10570

System Type

.

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	14.3	
Sub Total	0.0	56,826.3	14.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	18.0	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10570

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

05-Арг-95

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

25,827

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-5

Typical Building Information

Typiour Dunaning morning									
Category	Category Construction		Occ.	Day					
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT					

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time		700	700	700	700	700	700
Stop Time		0 1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

	INPUTS		INPUT
	Motor HP		15
	Load Factor		0.8
	CFM - HTG		10000
	CFM - CLG		0
	% OA		100.00%
	% Area		3.00%
	TON CAPC.		0
	MBTU CAPC.		0
	kW/Ton		0
	MOSON		12
	EFF		1
LOO	K-UP VALUE		
	EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	The state of the s
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
НОАОНС	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10570

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	***************************************
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.2	***************************************
Sub Total	0.0	56,826.3	7.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	9.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10570

05-Apr-95 PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

25,827

System Type

MAU6

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

Typical Building Information

		i ypicai E	bulluling information		
Category		Construction	Use	Occ.	Day
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16100
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	Print, 2011
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10570

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	12.0	
Sub Total	0.0	56,826.3	12.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	15.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10570

EMC NO.: 1406-006

DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

25,827

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-7

Typical Building Information

Category Construction		Use	Occ.	Day	
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT	

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	1	0 0	0	0	0
Stop Time	2400	2400	240	0 2400	2400	2400	2400

INPUTS	INPUT
Motor HP	7.5
Load Factor	0.8
CFM - HTG	16100
CFM - CLG	0
% OA	100.00%
% Area	2.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 83.10%	83.10%

HOURS	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10570

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

MAU-7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	28,632.0	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	4.8	
Sub Total	0.0	29,644.0	4.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	29,644.0	6.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10570

05-Apr-95

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

25,827

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HTP1

Typical Building Information

	. , , , , , , , , , ,			
Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

20 32

Enter Weeks of Summer: Enter Weeks of Winter:

Required Operation	S		M	T	W	TH	F	S
Start Time		0	700	700	700	700	700	700
Stop Time		0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

	INPUTS		INPUT			
	Motor HP		5			
	Load Factor		0.8			
	CFM - HTG		0			
	CFM - CLG		0			
	% OA		0.00%			
	% Area					
	TON CAPC.		0			
	MBTU CAPC.		3.587			
	kW/Ton		0			
	MOSON		7			
	EFF		1			
LOOK	-UP VALUE					
	EFFHP	81.60%	81.60%			

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10570

System Name:

12 BASEBOARD RADIATION

System Number:

HTP1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	57.4	
Sub Total	0.0	12,616.7	57.4	The state of the s
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	14.7	
HW OA Reset	0.0	0.0	26.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	98.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10570

05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

25,827

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HTP2

Typical Building Information

Category	Construction	Use	Occ.	Day
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Facto	r	0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC		4.62
kW/Tor	1	0
MOSON	1	7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	1 - 1000 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10570

System Type

....

System Name:

CONVERTER AND PUMPS

System Number:

HTP2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	***************************************
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	34.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	34.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10570

DATE: 05-Apr-9
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

25,827

System Type
System Name:

CONVERTER AND PUMPS

System Number:

HTP3

Typical Building Information

	. , p			
Category	Construction	Use	Occ.	Day
1/	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	w	TH	F	S
Start Time	0	700	700	700	700	700	700
Ston Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	5
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	4.258
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10570

System Type System Name:

CONVERTER AND PUMPS

System Number:

HTP3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	•
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	31.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	31.5	3

ENERGY CALCULATIONS

BUILDING 10580

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10580

CHECKED BY: KC/WLC PAGE 1 OF 2

DATE:

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

05-Apr-95

Building Sq.Ft.:

27,310

System Type

2

System Name:

H&V UNIT

System Number:

HV1

Typical Building Information

1 y produce a distriction of the second of t							
Category	Construction	Use	Occ.	Day			
1	B BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG	11135	
CFM - CLG	0	
% OA		100.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	VIVA 2000 4 - 55 - 12 - 550 5
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	-
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
НОАОНС		9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC .	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10580

System Type

2

System Name:

H&V UNIT

System Number:

HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	7.44
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	25.3	
Sub Total	0.0	83,884.9	25.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	****
DDC Control	0.0	0.0	6.5	18 4 8 6 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,	-			
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	31.7	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10580

)

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

DATE:

PAGE 1 OF 2

04-Apr-95

Building Sq.Ft.: System Type 27,310

System Name:

H&V UNIT

System Number:

HV2

Typical Building Information

		i ypicai E	dianing information		
Category		Construction	Use	Occ.	Day
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	27.5
Load Factor	0.8
CFM - HTG	11410
CFM - CLG	0
% OA	33.00%
% Area	10.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 89.40%	89.40%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	12.73
Heating HRSAV	3,264	
C/H HŘSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10580

System Type

2

System Name:

H&V UNIT

System Number:

HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	97,585.7	0.0	
Optimum ST/SP	0.0	3,449.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	The state of the s
Night Setback	0.0	0.0	25.3	
Sub Total	0.0	101,035.1	25.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	101,035.1	31.7	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

27,310

10580

Building Sq.Ft.:

System Type System Name:

Stop Time

System Number:

H&V UNIT HV3

		Typical B	uilding information		
	Category	Construction	Use	Occ.	Day
i	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

0

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F
Start Time	0	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	22.5
Load Factor	0.8
CFM - HTG	6020
CFM - CLG	0
% OA	33.00%
% Area	10.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 88.10	% 88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HŘSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

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S 700

1600

04-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10580

System Type

2

System Name: System Number: H&V UNIT HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	25.3	
Sub Total	0.0	83,884.9	25.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.5	
HW OA Reset	0.0	0.0	0.0	·
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	"
Remote Monitoring, Maintenance,		•		
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	31.7	301.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

27,310

10580

Building Sq.Ft.:

System Type

2

System Name: System Number:

HV4

H&V UNIT

Typical Building Information

	Typical Building information							
ſ	Category	Occ.	Day					
ľ	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter: 3

Required Operation	S	M	T	W	TH	<u> </u>	8
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	22.5
Load Factor	0.8
CFM - HTG	4090
CFM - CLG	0
% OA	100.00%
% Area	5.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR		7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10580

System Type

System Name:

H&V UNIT

System Number:

HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	,
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	12.6	
Sub Total	0.0	83,884.9	12.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	15.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10580

DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

27,310

System Type
System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-1

Typical Building Information

- J								
Category		Construction	Use	Occ.	Day			
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	18150
CFM - CLG	0
% OA	100.00%
% Area	6.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP	86.70% 86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10580

System Type

.

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	15.2	
Sub Total	0.0	56,826.3	15.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	19.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

27,310

10580

Building Sq.Ft.:

BLDG:

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-2

Typical Building Information

Typical Building information								
Category Constru		Construction	Use	Occ.	Day			
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer:

Eliter Meeks of Summer.	
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	5
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9200
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

05-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10580

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	•
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.6	
Sub Total	0.0	56,826.3	7.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	9.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10580

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

05-Apr-95

EMC NO.: 1406-006

PAGE 1 OF 2

DATE:

Building Sq.Ft.:

27,310

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-3

Typical Building Information

. yp.ou. = unung								
Category Construction		Use	Occ.	Day				
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16920
CFM - CLG	0	
% OA	100.00%	
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

LOOK-UP	INPUT
0.00	0.00
0.00	0.00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
15.77	15.77
9.68	9.68
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00	0.00
0.17	0.17
0.00E+00	0.00E+00
2.36E+03	2.36E+03
9.26E+03	9.26E+03
0	0
9.57	9.57
7.40	7.40
188.00	188.00
	0.00 0.00E+00 0.00E+00 15.77 9.68 0.00E+00 0.00E+00 0.17 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+03 9.26E+03 9.57 7.40

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10580

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	15.2	
Sub Total	0.0	56,826.3	15.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	19.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10580

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

05-Apr-95

EMC NO.: 1406-006

PAGE 1 OF 2

DATE:

Building Sq.Ft.:

27,310

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: MAU-4

Typical Building Information

Category Construction		Use	Occ.	Day	
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

20

Enter Weeks of Summer: 32 **Enter Weeks of Winter:**

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		20000
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

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Bldg Number: System Type 10580

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	and the second s
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	15.2	
Sub Total	0.0	56,826.3	15.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	19.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10580

05-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

27,310

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: MAU-5

Typical Building Information

	. yp.ou unang managana							
ſ	Category	Construction	Use	Occ.	Day			
İ	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

20

Enter Weeks of Summer: 32 **Enter Weeks of Winter:**

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10000
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	Provident and Artists of the Artists
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10580

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-5

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.6	
Sub Total	0.0	56,826.3	7.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	9.5	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10580

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

05-Apr-95

Building Sq.Ft.: System Type

27,310

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU6

Typical Building Information

Typiour Daniang							
Category		Construction	Use	Occ.	Day		
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT					
Motor HP							
Load Factor		0.8					
CFM - HTG		16100					
CFM - CLG		0					
· % OA	100.00%						
% Area		5.00%					
TON CAPC.		0					
MBTU CAPC.		0					
kW/Ton		0					
MOSON		12					
EFF		1					
LOOK-UP VALUE							
EFFHP	86.70%	86.70%					

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
. ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10580

System Type

1050

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	12.6	
Sub Total	0.0	56,826.3	12.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	15.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10580

DATE: 05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

27,310

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

MAU-7

Typical Building Information

Typical Building Information								
Category	Construction	Use	Occ.	Day				
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	7.00	INPUT
Motor HP	7.5	
Load Factor		0.8
CFM - HTG		16100
CFM - CLG		0
% OA	100.00%	
% Area	2.00%	
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HŘSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10580

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	28,632.0	0.0	<u> </u>
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	5.1	
Sub Total	0.0	29,644.0	5.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	29,644.0	6.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10580

DATE: 05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

27,310

System Type

12 BASEBOARD RADIATION

System Name: System Number:

HTP1

Typical Building Information

Typical building information									
Category Construction		Use	Occ.	Day					
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT					

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		8.0
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		3.587
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS	REQUIRED PRESENT				
CALCULATIONS	HR/YR	HR/YR			
Cooling HRSON	1,320	3,360			
Heating HRSON	2,112	5,376			
C/H HRSON	3,441	8,760			
Cooling HRSAV	2,040				
Heating HRSAV	3,264				
C/H HRSAV	5,319				

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

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Bldg Number:

10580

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HTP1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	60.7	
Sub Total	0.0	12,616.7	60.7	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	15.5	
HW OA Reset	0.0	0.0	26.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	102.7	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10580

DATE: 05-Apr-95 PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

27,310

System Type

21,010

System Name:

CONVERTER AND PUMPS

System Number:

HTP2

Typical Building Information

Typion Duning morning										
Category	Construction	Use	Occ.	Day						
1	8 BRICK	VEH MNT SHOP	0700-1900	SUN-SAT						

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.62
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	No. We have a first building to
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10580

System Type

9

System Name: System Number: CONVERTER AND PUMPS HTP2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	·
HW OA Reset	0.0	0.0	34.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	34.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10580

Building Sq.Ft.: 27,310

System Type

9

System Name:

CONVERTER AND PUMPS

System Number:

HTP3

Typical Building Information

Typical Building information						
Category	Construction	Use	Occ.	Day		
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.258
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	WWW. Commission of the state of
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

		Control of the second second second
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10580

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HTP3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	31.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	31.5	3

ENERGY CALCULATIONS

BUILDING 10610

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10610

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

Building Sq.Ft.:

12,452

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

	Typical Building Information							
Category	Construction	Use	Occ.	Day				
1	7 BRICK	BN HQ BLDG	0600-1700	SUN-SAT				

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bidg Number: System Type 10610

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	163.3	
Sub Total	0.0	8,501.7	163.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,501.7	176.0	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10610

CHECKED BY: KC/WLC PAGE 1 OF 2

DATE:

EMC NO.: 1406-006

05-Apr-95 PREPARED BY: CSW/BMG

Building Sq.Ft.:

12,452

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

AHU-2

Typical Building Information						
Category	Construction	Use	Occ.	Day		
17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	1
Load Factor	8.0
CFM - HTG	210
CFM - CLG	0
% OA	100.00%
% Area	4.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 69	.20% 69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

2000	CONSTANT	LOOK-UP	INPUT
	HOAUH	0.00	0.00
	HOAUHC	0.00	0.00
	COAUC	0.00E+00	0.00E+00
	COAUHC	0.00E+00	0.00E+00
	НОАОН	257.00	257.00
	HOAOHC	158.00	158.00
	COAOC	0.00E+00	0.00E+00
	COAOHC	0.00E+00	0.00E+00
	DC DUTY	0.00	0.00
	DC DEMAN	0.17	0.17
	ECC	0.00E+00	0.00E+00
	ECHC	0.00E+00	0.00E+00
	NSUCC	0.00E+00	0.00E+00
	NSUCHC	0.00E+00	0.00E+00
	DDCCHC	0.00E+00	0.00E+00
	DDCCC	0.00E+00	0.00E+00
	DSC	4.84E+03	4.84E+03
	NSC	6.25E+04	6.25E+04
	FV	0	0
	CHWR	9.57	9.57
	OAR	7.40	7.40
	OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10610

System Type

1 H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	***************************************
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	31.1	
Sub Total	0.0	4,791.4	31.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	4,791.4	33.5	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10610

CHECKE

DATE: 04-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:
System Type

12,452

System Name:

CONVERTER AND PUMPS

System Number:

HE1

Typical Building Information

Typical Danaing information					
Category		Construction	Use	Occ.	Day
<u> </u>	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
· FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10610 9

System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,328.6	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,328.6	1.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10610

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

04-Apr-95

EMC NO.: 1406-006

DATE:

PAGE 1 OF 2

Building Sq.Ft.:

12,452

System Type

12 BASEBOARD RADIATION

System Name: System Number:

HE2

Typical Building Information

Typical bulling information						
Category		Construction	Use	Occ.	Day	
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT	

Enter Weeks of Summer:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.75
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	75.00%
TON CAPC.	0
MBTU CAPC.	0.1117
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 6	65.00% 65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

	CONSTANT	LOOK-UP	INPUT
	HOAUH	0.00	0.00
	HOAUHC	0.00	0.00
	COAUC	0.00E+00	0.00E+00
<u> </u>	COAUHC	0.00E+00	0.00E+00
	НОАОН	257.00	257.00
	HOAOHC	158.00	158.00
L	COAOC	0.00E+00	0.00E+00
	COAOHC	0.00E+00	0.00E+00
	DC DUTY	0.00	0.00
	DC DEMAN	0.17	0.17
	ECC	0.00E+00	0.00E+00
	ECHC	0.00E+00	0.00E+00
	NSUCC	0.00E+00	0.00E+00
	NSUCHC	0.00E+00	0.00E+00
	DDCCHC	0.00E+00	0.00E+00
	DDCCC	0.00E+00	0.00E+00
	DSC	4.84E+03	4.84E+03
	NSC	6.25E+04	6.25E+04
	FV	0	0
	CHWR	9.57	9.57
	OAR	7.40	7.40
	OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10610

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	583.3	
Sub Total	0.0	2,397.8	583.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,397.8	629.4	3

ENERGY CALCULATIONS

BUILDING 10612

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

DATE: 01-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

2400

EMC NO.: 1406-006

10,612

2400

2400

Building Sq.Ft.:

53,892

System Type

Stop Time

9

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

Typical Building Information

Typiour Zananig mioriia							
Category Construction		Use	Occ.	Day			
	4 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

2400

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	-	0	0	0	0	0	

2400

Present Operations	S	М	T	W	TH	F_	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT				
Motor HP		2				
Load Factor		0.8				
CFM - HTG						
CFM - CLG	0					
% OA		0.00%				
% Area		0.00%				
TON CAPC.		0				
MBTU CAPC.		0.5123				
kW/Ton		0				
MOSON		7				
EFF		1				
LOOK-UP VALUE						
EFFHP	78.00%	78.00%				

HOURS CALCULATIONS	REQUIRED HR/YR	 Support of the control
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

2400

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,612

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	3.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	3.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10,612

BLDG:

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

01-Apr-95

Building Sq.Ft.: System Type

53,892 12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

Typical Building Information

Typical Danaing intermedia								
Category Construction		Use	Occ.	Day				
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA	0.00%	
% Area	0.00%	
TON CAPC.	0	
MBTU CAPC.	0.9801	
kW/Ton	0	
MOSON	7	
EFF	1	
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10,612

System Name:

12 BASEBOARD RADIATION

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL ALIPSA SECRETARIO	0.0	0.0	7.3	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG: 18,323

10612

EMC NO.: 1406-006

DATE: 12-Apr-95

PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type System Name: 14

System Number:

VENTILATION AHU-1

Typical Building Information

		· <u> </u>			
Ca	tegory	Construction	Use	Occ.	Day
	14	BRICK	ADM & SUPPLY,ENL BRK W	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:	32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0
Stop Tarie	L	1	L		1		

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number:

10612

System Type

14

System Name:

VENTILATION

System Number:

AHU-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10612

01-Apr-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

System Type

System Name:

VENTILATION

System Number:

AHU2

Typical Building Information

Category	Category Construction		Use	Occ.	Day
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	3
Load Factor	0.8
CFM - HTG	0
CFM - CLG	4566
% OA	100.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	5
EFF	1
LOOK-UP VALUE	
EFFHP 79.00%	79.00%

HOURS	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC		110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10612

System Type

14

System Name:

VENTILATION

System Number:

AHU2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	34 (14 A)

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10612

EMC NO.: 1406-006

12-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

18,323

System Type

14

System Name:

VENTILATION

System Number:

AHU3

Typical Building Information

Typical Daliding Information								
Category	Construction	struction Use		Day				
	4 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	3	
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4566
% OA	100.00%	
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bidg Number: System Type

10612

System Name:

14 **VENTILATION**

System Number:

AHU3

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY** BLDG:

LOCATION: FT. DRUM

10612

12-Apr-95 DATE:

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

18,323

System Type

14

System Name:

VENTILATION

System Number:

AHU-4

Typical Building Information

	Typical ballating information								
Category				Occ.	Day				
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		4779
CFM - CLG		0
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number:

10612

System Type

14 **VENTILATION**

System Name: System Number:

AHU-4

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

18,323

10612

Building Sq.Ft.:

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

Typical Building Information

Typical building information								
Category	Construction	Use	Occ.	Day				
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	w	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	750
CFM - CLG	0
% OA	100.00%
% Area	12.75%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTAN	Γ :	LOOK-UP	INPUT
HOA	NUH	0.00	0.00
HOAL	JHC	0.00	0.00
COA	NUC	0.00E+00	0.00E+00
COAL	JHC	0.00E+00	0.00E+00
HOA	NOH	220.75	220.75
HOAC	HC	110.07	110.07
COA	OC	0.00E+00	0.00E+00
COAC	HC	0.00E+00	0.00E+00
DC DI	JTY	0.00	0.00
DC DEM/	٩N	0.17	0.17
E	ECC	0.00E+00	0.00E+00
EC	CHC	0.00E+00	0.00E+00
NSI	JCC	0.00E+00	0.00E+00
NSUC	CHC	0.00E+00	0.00E+00
DDCC	CHC	0.00E+00	0.00E+00
DDC	CCC	0.00E+00	0.00E+00
	osc	5.84E+03	5.84E+03
1	NSC	4.86E+04	4.86E+04
	F۷	0	0
CH	WR	9.57	9.57
(DAR	7.40	7.40
(OPT	188.00	188.00
L			

EMC NO.: 1406-006

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PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

02-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

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Bldg Number:

10612

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	-
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	113.6	
Sub Total	0.0	1,683.3	113.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	127.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10612

Building Sq.Ft.:
System Type

18,323

__

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

AHU7

Typical Building Information

	Typical Daliding Information						
Category	Construction	Use	Occ.	Day			
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	1
C/H HRSAV	5,371]

CONSTANT	LOOK-UP	INPUT
HOAUH		0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

02-Apr-95

DATE:

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10612

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	<u>-</u>
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	113.6	
Sub Total	0.0	1,683.3	113.6	
Economizer	0.0	0.0	0.0	****
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				*****
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	127.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

18,323

10612

Building Sq.Ft.: System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU8

Typical Building Information

Typical Building information								
Category		Construction	Use	Occ.	Day			
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

			T	w	TH	F	S
Required Operation Start Time	0	M 600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

S	M	T	W	TH	F	S
0	0	0	0	0	0	0
2400	2400	2400	2400	2400	2400	2400
	\$ 0 2400	0 0	0 0 0	0 0 0 0	S M I W IH	0 0 0 0 0

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC		0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR		9.57
OAR	7.40	7.40
ОРТ	188.00	188.00

EMC NO.: 1406-006

DATE: 02-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

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PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

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Bldg Number: System Type 10612

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

8UHA

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	<u> </u>
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	113.6	
Sub Total	0.0	1,683.3	113.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	127.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10612

DATE:

02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

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EMC NO.: 1406-006

Building Sq.Ft.:

18,323

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

AHU9 System Number:

Typical Building Information

Typical Banding thiorination							
Category	Construction	Use	Occ.	Day			
	4 BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC		0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC		5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

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Bldg Number:

10612

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU9

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	113.6	
Sub Total	0.0	1,683.3	113.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,			-	
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	127.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10612

EMC NO.: 1406-006

DATE: 02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

35,569

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU10

Typical Building Information

Typical Dallang Internation								
Category Construction		Use	Occ.	Day				
1:	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT				

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.5
Load Factor	0.8
CFM - HTG	1860
CFM - CLG	0
% OA	100.00%
% Area	19.30%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR		
Cooling HRSON	3,360	3,360	
Heating HRSON	5,376	5,376	
C/H HRSON	8,760	8,760	
Cooling HRSAV	0		
Heating HRSAV	0		
C/H HRSAV	0		

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

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Bldg Number:

10612

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU10

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	83.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	83.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10612

Building Sq.Ft.:

35,569

System Type

System Name: System Number: **H&V UNIT WITHOUT RETURN FAN**

AHU11

Typical Building Information

Typical Ballating Information								
Category	Category Construction		Occ.	Day				
1	5 BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	. 0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	0.33	
Load Factor		0.8
CFM - HTG		1350
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	\$660 mentions and and an arranged
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONCTANT	LOOK-UP	INPUT
CONSTANT		and the same of th
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

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02-Арг-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10512

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU11

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	80.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	0.0	80.7	

ENERGY CALCULATIONS

BUILDING 10614

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10,614

Building Sq.Ft.: System Type

44,510

9

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

Typical Building Information

	Typical Ballaning information							
	Category	Construction	Use	Occ.	Day			
İ		4 BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS			INPUT			
Motor HI	2					
Load Facto	Load Factor					
CFM - HTC	3		0			
CFM - CLC	3		0			
% O/	A		0.00%			
% Are	а		0.00%			
TON CAPO) .		0			
MBTU CAP	C.		0.3875			
kW/To	on		0			
MOSO	N		7			
EF	F		1			
LOOK-UP VALUE						
EFFH	P	78.00%	78.00%			

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

LOOK-UP	INPUT
0.00	0.00
0.00	0.00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
220.75	220.75
110.07	110.07
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00	0.00
0.17	0.17
0.00E+00	0.00E+00
5.84E+03	5.84E+03
4.86E+04	4.86E+04
0	0
9.57	9.57
7.40	7.40
188.00	188.00
	0.00 0.00E+00 0.00E+00 220.75 110.07 0.00E+00 0.00E+00 0.017 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 7.40

EMC NO.: 1406-006

01-Apr-95 DATE:

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,614

System Type

. .

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	2.9	34. ± 4.0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10,614

01-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

44,510

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

Typical Building Information

. J P						
Category Construction U		Use	Occ.	Day		
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.6683
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS		PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,614

System Type

System Name:

BASEBOARD RADIATION

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	4.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10614

Building Sq.Ft.:

11,128

System Type

System Name: System Number: **H&V UNIT WITHOUT RETURN FAN**

AHU1

EMC NO.: 1406-006

DATE:

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

02-Арг-95

PAGE 1 OF 2

Typical Building Information

	Typiour Bunding morning							
	Category	Construction	Use	Occ.	Day			
Ì	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT		
Motor HP		0.33		
Load Factor		0.8		
CFM - HTG		770		
CFM - CLG		0		
% OA	% OA			
% Area		17.00%		
TON CAPC.		0		
MBTU CAPC.		0		
kW/Ton		0		
MOSON		12		
EFF		1		
LOOK-UP VALUE				
EFFHP	65.00%	65.00%		

HOURS CALCULATIONS	REQUIRED HR/YR	NAMES AND ADDRESS OF THE PARTY
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10614

System Type

.

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	92.0	
Sub Total	0.0	1,683.3	92.0	• .
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	103.1	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10614

EMC NO.: 1406-006

DATE: 02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

11,128

System Type

- 1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: AHU2

Typical Building Information

Typical Ballating Internation							
Category		Construction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	770
CFM - CLG	0
% OA	100.00%
% Area	17.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	 5 1 200 5 20 20 0 0 0 700
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HŘSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10614

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	· · · · · · · · · · · · · · · · · · ·
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	92.0	
Sub Total	0.0	1,683.3	92.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.0	
HW OA Reset	0.0	0.0	0.0	8 1 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	103.1	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10614

DATE:

02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

11,128

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU4

Typical Building Information

Typious Bullating Intermediate							
Category		Construction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
. CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10614

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	92.0	
Sub Total	0.0	1,683.3	92.0	
Economizer	0.0	0.0	0.0	*******
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	11.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	103.1	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10614

01-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

33,383

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

AHU5

Typical Building Information

Category	Construction	Use	Occ.	Day
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10614

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	79.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	0.0	79.5	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10614

01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

33,383

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

Typical Building Information

Typical Danaing Information								
Category	Category Construction		Occ.	Day				
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT				

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

77:34 141:34	INPUTS	1.4 (6.56.5)	INPUT
	Motor HP		0.33
	Load Factor		0.8
	CFM - HTG		1060
	CFM - CLG		0
	% OA		100.00%
	% Area		16.70%
	TON CAPC.		0
	MBTU CAPC.		0
	kW/Ton		0
	MOSON		12
	EFF		1
LOOP	C-UP VALUE		
	EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	4	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10614

System Type

.

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr				
Schedule ST/SP	0.0	0.0	0.0					
Optimum ST/SP	0.0	0.0	0.0					
Duty Cycle	0.0	0.0	0.0					
Demand Limit	0.0	0.0	0.0					
Night Setback	0.0	0.0	0.0					
Sub Total	0.0	0.0	0.0					
Economizer	0.0	0.0	0.0					
Ventilation/Recirculation	0.0	0.0	0.0					
DDC Control	0.0	0.0	79.5					
HW OA Reset	0.0	0.0	0.0					
Chilled Water Reset	0.0	0.0	0.0					
Condenser Water Reset	0.0	0.0	0.0					
Chiller Demand Limit	0.0	0.0	0.0					
Remote Monitoring, Maintenance,								
Run Time, and Safety Alarms	Run Time, and Safety Alarms							
TOTAL	0.0	0.0	79.5	3				

ENERGY CALCULATIONS

BUILDING 10620

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10620

EMC NO.: 1406-006

DATE: 05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

13,225

System Type

!

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

Typical Bullating Internation							٦
Category		Construction	Use		Occ.	Day	
	17	BRICK	BN HQ BLDG		0600-1700	SUN-SAT	

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HŘSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

10620

Bldg Number: System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	•
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	173.5	100000000000000000000000000000000000000
Sub Total	0.0	8,501.7	173.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,501.7	186.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10620

Building Sq.Ft.: System Type

13,225

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

Typical Building Information

	Typical Building Information								
	Category	Construction	Use	Occ.	Day				
Ì	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG	0	
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP 69	.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

05-Apr-95

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bidg Number:

10620

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	33.0	
Sub Total	0.0	4,791.4	33.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,791.4	35.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10620

PAGE 1 OF 2

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

04-Apr-95

Building Sq.Ft.:

13,225

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE1

Typical Building Information

	Typical Building Information								
[Category	Construction	Use	Occ.	Day				
Ì	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH_	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	2148	INPUT
Motor HP	2	
Load Factor		0.8
CFM - HTG		0
CFM - CLG	0	
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.2602
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HŘSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10620

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	-
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,328.6	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,328.6	1.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG: 13,225

10620

Building Sq.Ft.: System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

Typical Building Information

Typical Building Information							
Category		Construction	Use	Occ.	Day		
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.75
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	75.00%
TON CAPC.	0
MBTU CAPC.	0.1117
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT LOOK-UP INPL HOAUH 0.00 HOAUHC 0.00	0.00
HOAUHC 0.00	
	0.00
COAUC 0.00E+00 0.00	E+00
COAUHC 0.00E+00 0.00	E+00
HOAOH 257.00 25	57.00
HOAOHC 158.00 1	58.00
COAOC 0.00E+00 0.00	E+00
COAOHC 0.00E+00 0.00	E+00
DC DUTY 0.00	0.00
DC DEMAN 0.17	0.17
ECC 0.00E+00 0.00	E+00
ECHC 0.00E+00 0.00	E+00
NSUCC 0.00E+00 0.00	E+00
NSUCHC 0.00E+00 0.00	E+00
DDCCHC 0.00E+00 0.00	E+00
DDCCC 0.00E+00 0.00	E+00
DSC 4.84E+03 4.84	E+03
NSC 6.25E+04 6.25	E+04
FV 0	0
CHWR 9.57	9.57
OAR 7.40	7.40
OPT 188.00 1	88.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

04-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10620

System Type

System Name:

12 **BASEBOARD RADIATION**

System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	619.6	
Sub Total	0.0	2,397.8	619.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	48.0	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,397.8	668.4	3

ENERGY CALCULATIONS

BUILDING 10622

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10622

-

DATE: 10-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

52,990

System Type

...

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

Typical Building Information

	. , p	4,1411.9 111.0111.011.01		
Category Construction		Use	Occ.	Day
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Litter Heeks of Cultilities.	
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA	0.00%	
% Area	0.00%	
TON CAPC.		0
MBTU CAPC.		0.3875
kW/Ton		0
MOSON		7
EFF	1	
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,900	3,360
Heating HRSON	3,040	5,376
C/H HRSON	4,954	8,760
Cooling HRSAV	1,460	
Heating HRSAV	2,336	
C/H HRSAV	3,806	

LOOK-UP INPUT CONSTANT HOAUH 0.00 0.00 0.00 0.00 HOAUHC COAUC 0.00E+00 0.00E+00 COAUHC 0.00E+00 0.00E+00 220.75 HOAOH 220.75 110.07 110.07 HOAOHC COAOC 0.00E+00 0.00E+00 0.00E+00 COAOHC 0.00E+00 DC DUTY 0.00 0.00 DC DEMAN 0.17 0.17 0.00E+00 ECC 0.00E+00 ECHC 0.00E+00 0.00E+00 0.00E+00 NSUCC 0.00E+00 NSUCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 0.00E+00 DDCCC 0.00E+00 DSC 5.84E+03 5.84E+03 4.86E+04 NSC 4.86E+04 0 F۷ 0 CHWR 9.57 9.57 7.40 OAR 7.40 OPT 188.00 188.00

^{*}ESTIMATED PUMP ON 50% OF UNOCCUPIED HOURS

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

10-Apr-95 PAGE 2 OF 2

Bldg Number:

10622

System Type

CONVERTER AND PUMPS

System Name: System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,572.8	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	3,860.3	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms		A1		3
TOTAL	0.0	3,860.3	2.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10,622

01-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

52,990

System Type System Name: 12

BASEBOARD RADIATION

System Number:

HE-2

Typical Building Information

.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,									
	Category	Construction	Use	Occ.	Day				
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.9801
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR		9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,622

System Type

1

System Name:

BASEBOARD RADIATION

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	7.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	7.3	4 % - 12 High and 1131

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10622

DATE: 12-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

18,017

System Type System Name: 14 VENTILATION

System Number:

AHU-1

Typical Building Information

Typical Cultury							
	Category	Construction	Use	Occ.	Day	l	
	14	BRICK	ADM & SUPPLY,ENL BRK V	0600-1700	MON-FRI		

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	3
Load Factor	0.8
CFM - HTG	0
CFM - CLG	4779
% OA	100.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	5
EFF	11_
LOOK-UP VALUE	
EFFHP 79.00	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number:

10622

System Type

14

System Name:

VENTILATION

System Number:

AHU-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10622

EMC NO.: 1406-006

DATE: 12-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

18,017

System Type System Name: 14 VENTILATION

System Number:

AHU-2

Typical Building Information

Typical Building Information							
Category		Construction	Use	Occ.	Day		
4	14	BRICK	ADM & SUPPLY,ENL BRK V	0600-1700	MON-FRI		

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0		0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

19	INPUTS		INPUT	
<u>India de la casa</u>	Motor HP		3	
	Load Factor		0.8	
	CFM - HTG		0	
	CFM - CLG		4779	
	% OA			
	% Area		0.00%	
	TON CAPC.		0	
	MBTU CAPC.		0	
	kW/Ton		0	
	MOSON		5	
	EFF		1	
LOOK-	UP VALUE			
	EFFHP	79.00%	79.00%	

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
F۷	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

12-Apr-95 PAGE 2 OF 2

Bldg Number:

10622

System Type

14

System Name: System Number: **VENTILATION** AHU-2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10622

EMC NO.: 1406-006 DATE: 01-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

18,017

System Type System Name: 14 VENTILATION

System Number:

AHU3

Typical Building Information

	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	fugi f		INPUT			
Motor	Motor HP					
Load Fa	ctor		0.8			
CFM - H	TG		0			
CFM - C	LG		4566			
%	OA		100.00%			
% A	rea		0.00%			
TON CAP	PC.		0			
MBTU CA	PC.		0			
kW/	Ton		0			
MOS	ON		5			
E	FF		1			
LOOK-UP VALUE						
EFF	HP	79.00%	79.00%			

HOURS	REQUIRED	PRESENT
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10622

System Type

14

System Name:

VENTILATION

System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10622

EMC NO.: 1406-006

DATE: 01-Apr-95

PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

18,017

System Type

10,017

System Name:

VENTILATION

System Number:

AHU4

Typical Building Information

Typical Dullang information							
Category	C	onstruction	Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	w	INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

01-Apr-95 PAGE 2 OF 2

Date:

Bldg Number:

10622

System Type System Name:

14 **VENTILATION**

System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	4. Angelous (1. 3.)

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10622

W

600

1700

2400

600

1700

2400

TH

600

1700

2400

BLDG:

02-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

S

0

0

2400

600

1700

2400

Building Sq.Ft.:

18,017

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

AHU6

Typical Building Information

Typica: Duniang								
Category Construction		Use	Occ.	Day				
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer: Enter Weeks of Winter:

Required Operation

Start Time

Stop Time

Stop Time

20 32

М

600

1700

2400

Eilfel Areeks of Armifel.	JE	

0

0

2400

S

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0

INPUTS			INPUT
Motor	HP		0.33
Load Fa	actor		0.8
CFM - H	łTG		750
CFM - C	CLG		0
%	OA		100.00%
% A	\rea		12.75%
TON CA	PC.		0
MBTU CA	APC.		0
kW	/Ton		0
MO	SON		12
	EFF		1
LOOK-UP VALUE			
EFI	FHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HŘSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10622

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	111.8	
Sub Total	0.0	1,683.3	111.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	125.2	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10622

1700

1700

1700

02-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

0

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

18,017

System Type

System Name:

Stop Time

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU7

Typical Building Information

		. ,	<u> </u>		-
Category		Construction	Use	Occ.	Day
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI

0

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	
Otart Time		4=00	4700	4700	4700	1700	

1700

1700

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	750
CFM - CLG	0
% OA	100.00%
% Area	12.75%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
ОРТ	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10622

System Type

.0022

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	111.8	
Sub Total	0.0	1,683.3	111.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		·		ANDONI
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	125.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

18,017

10622

DATE: 02-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type

System Name: System Number:

H&V UNIT WITHOUT RETURN FAN 8UHA

Typical Building Information

		. , p.ou			
Category Co		Construction	Construction Use		Day
		4 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	TWO SERVING MINES IN THE
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10622

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

8UHA

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	111.8	
Sub Total	0.0	1,683.3	111.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				·
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	125.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10622

DATE: 02-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

18,017

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU9

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10622

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	111.8	
Sub Total	0.0	1,683.3	111.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	125.2	## 1.00 PM 11.30

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10622

DATE:

EMC NO.: 1406-006

02-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

34,973

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: AHU10

Typical Building Information

. y p. o u. = u. u. g							
Category	Construction	Use	Occ.	Day			
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

	INPUTS		INPUT
	Motor HP		0.5
	Load Factor		0.8
	CFM - HTG		1860
	CFM - CLG		0
	% OA		100.00%
	% Area		19.30%
	TON CAPC.		0
	MBTU CAPC.		0
	kW/Ton		0
	MOSON		12
	EFF		1
LOO	K-UP VALUE		
	EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	. 0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
НОАОНС	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC		1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR		9.57
OAR		7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10622

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	81.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	81.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10622

EMC NO.: 1406-006 DATE: 02-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type

34,973 1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU11

Typical Building Information

Category	Construction	Use	Occ.	Day					
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT					

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	0.33	
Load Factor	0.8	
CFM - HTG		1350
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
НОАОНС	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10622

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	A CONTRACTOR OF THE CONTRACTOR
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	81.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	81.9	3

ENERGY CALCULATIONS

BUILDING 10630

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

12,452

10630

28-Mar-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

Category		Construction	Use	Occ.	Day
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.40%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10630

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	166.4	
Sub Total	0.0	8,501.7	166.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,501.7	179.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10630

28-Маг-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

System Type

12,452

System Name:

H&V UNIT WITHOUT RETURN FAN AHU2

System Number:

Typical Building Information

Typical Ballanig Information						
Category		Construction	Use	Occ.	Day	
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT	

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		3.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10630

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	,
Night Setback	0.0	0.0	28.0	
Sub Total	0.0	4,791.4	28.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,791.4	30.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

450

10630

DATE: 28-Mar-95 PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

12,452

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

Typical Building Information

., p							
Category	Category Construction		Occ.	Day			
	BRICK	BN HQ BLDG	0600-1700	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0
Stop Time		1700	1700	1700	1,00	L	

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG	·	0
% OA		0.00%
% Area		75.00%
TON CAPC.		0
MBTU CAPC.		0.1117
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
НОАОНС	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10630

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	583.3	
Sub Total	0.0	2,397.8	583.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		,		
Run Time, and Safety Alarms				3
TOTAL	0.0	2,397.8	629.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10630

DATE: 28-Mar-95

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

12,452

System Type

9

System Name:

CONVERTER AND PUMPS

System Number:

HE1

Typical Building Information

Category Construction		Use	Occ.	Day	
L	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.2602
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
СОАОНС	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
, DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10630

System Type

9

System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
	0.0	5,041.0	0.0	
Schedule ST/SP	0.0	287.5	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit			0.0	
Night Setback	0.0	0.0		<u> </u>
Sub Total	0.0	5,328.6	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				3
Run Time, and Safety Alarms			4.0	
TOTAL	0.0	5,328.6	1.9	3

ENERGY CALCULATIONS

BUILDING 10632

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10,632

01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

51,794

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

Typical Building Information

. yprout Daniang intermedia							
Category	Construction	Use	Occ.	Day			
14	# BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.5123
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	5 57 5 5 4 50 50 4.60
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,632

System Type

CONVERTER AND PUMPS

System Name: System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	3.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	3.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10,632

DATE: 01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

51,794

System Type System Name:

12 **BASEBOARD RADIATION**

System Number:

HE-2

Typical Building Information

Typical Ballating Information							
Category	Construction	Use	Occ.	Day			
	14 BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.75
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.9801
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,632

System Type

12

System Name:

BASEBOARD RADIATION

System Number: HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	2012
HW OA Reset	0.0	0.0	7.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL MEDICAL AND STORES	0.0	0.0	7.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10632

EMC NO.: 1406-006

DATE: 12-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

S

1700

1700

1700

0

0

Building Sq.Ft.:

17,610

System Type

14 VENTILATION

System Name: System Number:

Stop Time

AHU-1

Typical Building Information

	Typical bullding information						
1	Category	Construction	Use	Occ.	Day		
ĺ	14	BRICK	ADM & SUPPLY,ENL BRK V	0600-1700	MON-FRI		

0

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F
Start Time	0	600	600	600	600	600
Grant Time						4700

1700

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

1700

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
НОАОНС		110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

12-Apr-95 PAGE 2 OF 2

Date:

Bldg Number:

10632

System Type

14 **VENTILATION**

System Name: System Number:

AHU-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10632

EMC NO.: 1406-006

DATE: 01-Apr-95
PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

17,610

System Type

14

System Name:

VENTILATION

System Number:

AHU2

Typical Building Information

Typical Building Intermedien								
Category	Co	onstruction	Use	Occ.	Day			
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

20 32

Enter Weeks of Summer: Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	: 0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS			INPUT
Motor HP			3
Load Factor			0.8
CFM - HTG			0
CFM - CLG			4566
% OA			100.00%
% Area			0.00%
TON CAPC.			0
MBTU CAPC.			0
kW/Ton			0
MOSON			5
EFF			1
LOOK-UP VALUE			
EFFHP	!	79.00%	79.00%

HOURS	REQUIRED	PRESENT
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3.296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV.		0
CHWR	9.57	
OAR		
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10632

14

System Name:

VENTILATION

System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr	
Schedule ST/SP	0.0	4,666.1	0.0		
Optimum ST/SP	0.0	425.8	0.0		
Duty Cycle	0.0	0.0	0.0		
Demand Limit	0.0	0.0	0.0		
Night Setback	0.0	0.0	0.0		
Sub Total	0.0	5,092.0	0.0		
Economizer	0.0	0.0	0.0		
Ventilation/Recirculation	0.0	0.0	0.0		
DDC Control	0.0	0.0	0.0		
HW OA Reset	0.0	0.0	0.0		
Chilled Water Reset	0.0	0.0	0.0		
Condenser Water Reset	0.0	0.0	0.0		
Chiller Demand Limit	0.0	0.0	0.0		
Remote Monitoring, Maintenance,					
Run Time, and Safety Alarms					3
TOTAL	0.0	5,092.0	0.0		3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10632

EMC NO.: 1406-006

DATE: 12-Apr-95

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type System Name: 14 VENTILATION

17,610

System Number:

AHU-3

Typical Building Information

		i ypicai b	uliuling information		
Category		Construction	Use	Occ.	Day
	14	BRICK	ADM & SUPPLY,ENL BRK V	0600-1700	MON-FRI

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Denvired Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
		1700	1700	1700	1700		0
Stop Time				L	1		

	9	М	τ	W	TH	F	S
Present Operations Start Time	0		. 0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4566
% OA	100.00%	
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

LOOK-UP	INPUT
0.00	0.00
0.00	0.00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
220.75	220.75
110.07	110.07
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00	0.00
0.17	0.17
0.00E+00	0.00E+00
5.84E+03	5.84E+03
4.86E+04	4.86E+04
0	0
9.57	9.57
7.40	7.40
188.00	188.00
	0.00 0.00E+00 0.00E+00 220.75 110.07 0.00E+00 0.00E+00 0.17 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 7.40

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10632

12-Apr-95 PAGE 2 OF 2

Date:

Bldg Number:

System Type System Name:

14 **VENTILATION**

System Number:

AHU-3

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	5,092.0	0.0	0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10632

EMC NO.: 1406-006

DATE:

01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type System Name:

VENTILATION

System Number:

AHU4

Typical Building Information

Typical Ballang Internation								
Category		Construction	Use	Occ.	Day			
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor	-	0.8
CFM - HTG		0
CFM - CLG		4779
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS	REQUIRED	PRESENT
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
НОАОНС	110.07	110.07
COAOC		0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC		5.84E+03
NSC		4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bidg Number:

10632

System Type

14 VENTILATION

System Name: System Number:

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,666.1	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,092.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,092.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10632

02-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

17,610

System Type

System Name: System Number: **H&V UNIT WITHOUT RETURN FAN**

AHU6

Typical Building Information

, ypiour Daniening morning							
Category	Construction	Use	Occ.	Day			
	4 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	750
CFM - CLG	0
% OA	100.00%
% Area	12.75%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10632

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	, , , , , , , , , , , , , , , , , , , ,
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	122.3	3 -3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10632

02-Apr-95 DATE: PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.: System Type

17,610

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU7

Typical Building Information

Typical Bananig internation							
Category Construction		Use	Occ.	Day			
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	750
CFM - CLG	0
% OA	100.00%
% Area	12.75%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 6	65.00% 65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10632

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	,
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	122.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

7 640

10632

EMC NO.: 1406-006

DATE: 02-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

17,610

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

8UHA

Typical Building Information

Typical Banang Internation							
Category	Category Construction Use		Use	Occ.	Day		
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10632

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		The second secon		
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	122.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10632

02-Apr-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

17,610

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU9

Typical Building Information

	Typical Dallating Internation							
Category Co		Construction	Construction Use		Day			
	1	4 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		750
CFM - CLG		0
% OA		100.00%
% Area		12.75%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	201 200 NASSA 201 1 4 4
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	. 7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10632

System Type

10002

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	109.2	
Sub Total	0.0	1,683.3	109.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	13.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms	3			
THE TOTAL	0.0	1,683.3	122.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10632

EMC NO.: 1406-006

DATE: 02-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

34,184

System Type

ype

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: AHU10

Typical Building Information

Typioui Danaing illioniano							
Category	Construction	Use	Occ.	Day			
, , , , , , , , , , , , , , , , , , , ,	15 BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.5
Load Factor	0.8
CFM - HTG	1860
CFM - CLG	0
% OA	100.00%
% Area	19.30%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0]

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
НОАОНС	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10632 1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	83.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				· · · · · · · · · · · · · · · · · · ·
Run Time, and Safety Alarms	3			
TOTAL	0.0	0.0	83.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG: 34,184

10632

2400

2400

DATE:

EMC NO.: 1406-006

02-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

S 0

2400

0

2400

Building Sq.Ft.:

System Type

System Name:

Start Time

Stop Time

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU11

Typical Building Information

Typiod: Dunanig intermedia							
Category		Construction	Use	Occ.	Day		
	15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT		

0

2400

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	Т	w	TH	F
Start Time	0	0	0	0	0	

0

2400

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1350
CFM - CLG		0
% OA		100.00%
% Area		19.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

HOAUHC 0. COAUC 0.00E+	
COAUC 0.00E+	00 0.00E+00
2011110 205	0.00E+00
COAUHC 0.00E+	
HOAOH 0.	0.00
HOAOHC 0.	0.00
COAOC 0.00E+	0.00E+00
COAOHC 0.00E+	00 0.00E+00
DC DUTY 0.	0.00
DC DEMAN 0.	17 0.17
ECC 0.00E+	0.00E+00
ECHC 0.00E+	
NSUCC 0.00E+	0.00E+00
NSUCHC 0.00E+	00 0.00E+00
DDCCHC 0.00E+	00 0.00E+00
DDCCC 0.00E+	00 0.00E+00
DSC 1.40E+	04 1.40E+04
NSC 0.00E+	0.00E+00
FV	0 0
CHWR 9.	57 9.57
OAR 7.	40 7.40
OPT 0.	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bidg Number:

10632

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	80.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	80.0	3

ENERGY CALCULATIONS

BUILDING 10640

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10640

Building Sq.Ft.:

12,452

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

	Typical Bulluling Information							
Γ	Category	Construction	Use	Occ.	Day			
Г	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		1230
CFM - CLG		0
% OA		100.00%
% Area		21.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO		0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC		4.84E+03
NSC		6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR		7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10640

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	8,214.2	0.0	*
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	163.3	
Sub Total	0.0	8,501.7	163.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	12.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,501.7	176.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10640

05-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

12,452

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

Typical Building Information

Typical Danaing information						
Category		Construction	Use	Occ.	Day	
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT	

Enter Weeks of Summer

20 32

Effet weeks of Summer.	
Enter Weeks of Winter:	3

Required Operation	S		M	T	W	TH	F	S
Start Time		0	600	600	600	600	600	0
Stop Time		0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	488.4	INPUT
Motor HP		1
Load Factor		0.8
CFM - HTG		210
CFM - CLG		0
% OA		100.00%
% Area		4.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP (39.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	E DO DESCRIPTION OF THE
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10640

System Type

4

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,629.4	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	31.1	
Sub Total	0.0	4,791.4	31.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,791.4	33.5	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10640

04-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

12,452

System Type

System Name:

CONVERTER AND PUMPS

System Number:

Typical Building Information

		. , p			,
Category		Construction	Use	Occ.	Day
	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.2602
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	Marin 100,0000 Project
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10640

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	5,041.0	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,328.6	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,328.6	1.9	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10640

EMC NO.: 1406-006

DATE: 04-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

12,452

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

Typical Building Information

		. , p.o.u. =	ramaning innermanen		
	Category	Construction	Use	Occ.	Day
1	17	BRICK	BN HQ BLDG	0600-1700	SUN-SAT

Enter Weeks of Summer:

20

32 **Enter Weeks of Winter:**

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	California de la composición dela composición de la composición de la composición de la composición de la composición dela composición de la composición de la composición dela composición dela composición de la composición de la composición dela composición de la composición de la composición dela composición dela composición dela composición dela composición dela compo		INPUT
Moto	r HP		0.75
Load F	actor		0.8
CFM -	HTG		0
CFM -	CLG		0
9	6 OA		0.00%
%	75.00%		
TON C	APC.		0
MBTU C	APC.		0.1117
kV	V/Ton		0
MC	SON		7
	EFF		1
LOOK-UP VALUE	-		
EF	FHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	257.00	257.00
HOAOHC	158.00	158.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	4.84E+03	4.84E+03
NSC	6.25E+04	6.25E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10640

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,268.5	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	583.3	
Sub Total	0.0	2,397.8	583.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	45.2	,
HW OA Reset	0.0	0.0	0.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,397.8	629.4	3

ENERGY CALCULATIONS

BUILDING 10642

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10,642

01-Apr-95 DATE: PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

43,790

System Type

9

System Name:

CONVERTER AND PUMPS

HE-1 System Number:

Typical Building Information							
Category	Construction	Use	Occ.	Day			
	4 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.3875
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	. 7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,642

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	•
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	2.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10,642

DATE: 01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

43,790

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE-2

Typical Building Information

Typiou. Danieli g till et al.							
Category	Construction	Use	Occ.	Day			
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.6683
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number: System Type

10,642

System Name:

12 **BASEBOARD RADIATION**

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	•
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	4.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10642

DATE: 02-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

10,948

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU1

Typical Building Information

Typical Danaing information								
Category	Category Construction		Occ.	Day				
1	4 BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700		1700	1700	0

Present Operations	S	M	T	W	TH	F	\$
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	1
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
НОАОНС	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHO		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number: System Type

10642

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	90.5	
Sub Total	0.0	1,683.3	90.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	101.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10642

02-Apr-95 DATE: PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

10,948

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

AHU2 System Number:

Typical Building Information

	. , p			
Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10642

System Type

•

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	90.5	
Sub Total	0.0	1,683.3	90.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	101.4	16. s. n. s. s. s. s. 3 s. 6

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10642

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

02-Apr-95

DATE:

PAGE 1 OF 2

Building Sq.Ft.:

t.:

10,948

System Type
System Name: H&V U

System Number:

H&V UNIT WITHOUT RETURN FAN

AHU4

Typical Building Information

Typical Building information						
Category	Construction	Use	Occ.	Day		
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA	100.00%	
% Area	17.00%	
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	P. Charles D. Branch (1996)
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10642

System Type

.

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	90.5	
Sub Total	0.0	1,683.3	90.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	101.4	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10642

PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

01-Apr-95

PAGE 1 OF 2

DATE:

Building Sq.Ft.:

32,843

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU5

Typical Building Information

Typical Building Internation						
Category	Construction	Use	Occ.	Day		
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	9	M	Т	w	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	0.8
CFM - HTG	1300
CFM - CLG	0
% OA	100.00%
% Area	16.70%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
НОАОНС	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10642

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	78.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	78.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10642

01-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

Typical Building Information

Typical building information								
Category	Construction	Use	Occ.	Day				
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT				

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	0.33	
Load Factor		0.8
CFM - HTG		1060
CFM - CLG	0	
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC		0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR		9.57
OAR	7.40	7.40
OPT	0.00	0.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10642

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	78.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				The second secon
Run Time, and Safety Alarms	3			
TOTAL	0.0	0.0	78.2	3

ENERGY CALCULATIONS

BUILDING 10644

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10,644

01-Apr-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

40,864

Building Sq.Ft.:

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE-1

Typical Building Information

. , , , , , , , , , , , , , , , , , , ,								
Category	Category Construction		Occ.	Day				
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.3875
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,644 9

System Type System Name:

CONVERTER AND PUMPS

System Number:

HE-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	•
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	287.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	287.5	2.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

HE-2

LOCATION: FT. DRUM

BLDG:

10,644

Building Sq.Ft.:

40,864

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

Typical Building Information

	Typical building information							
Category		Construction	Use	Occ.	Day			
·	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Stop Time

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.75
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0.6683
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	· 0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

01-Apr-95

DATE:

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

01-Apr-95 PAGE 2 OF 2

Bldg Number:

10,644

System Type

1:

System Name:

BASEBOARD RADIATION

System Number:

HE-2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	110000000
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	4.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10644

Building Sq.Ft.:

System Type

10,216

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

AHU1

Typical Building Information						
Category	Construction	Use	Occ.	Day		
14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI		

Enter Weeks of Summer:

Enter Weeks of Winter:

32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor	0.8	
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296]
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHO		0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	5.84E+03	5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR		7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

02-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10644

System Type

1 H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	· · · · · · · · · · · · · · · · · · ·
Night Setback	0.0	0.0	84.5	
Sub Total	0.0	1,683.3	84.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	~
DDC Control	0.0	0.0	10.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	94.6	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10644

Building Sq.Ft.: System Type

10,216

System Name:

H&V UNIT WITHOUT RETURN FAN

AHU2 System Number:

Typical Building Information

Typical bulluting information								
Category		Construction	Use	Occ.	Day			
	14	BRICK	ADM & SUPPLY, ENL BRK	0600-1700	MON-FRI			

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT		
Motor HP				
Load Factor		0.8		
CFM - HTG		770		
CFM - CLG		0		
% OA		100.00%		
% Area		17.00%		
TON CAPC.		0		
MBTU CAPC.		0		
kW/Ton		0		
MOSON		12		
EFF	*	1		
LOOK-UP VALUE				
EFFHP	65.00%	65.00%		

HOURS CALCULATIONS	REQUIRED HR/YR	Fact S. 1. Obs. 124, 600, 007
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

LOOK-UP	INPUT
0.00	0.00
0.00	0.00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
220.75	220.75
110.07	110.07
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00	0.00
0.17	0.17
0.00E+00	0.00E+00
5.84E+03	5.84E+03
4.86E+04	4.86E+04
0	0
9.57	9.57
7.40	7.40
188.00	188.00
	0.00 0.00E+00 0.00E+00 220.75 110.07 0.00E+00 0.00 0.17 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 7.84E+03 4.86E+04 0

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

02-Apr-95

DATE:

PAGE 1 OF 2

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10644

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback ·	0.0	0.0	84.5	
Sub Total	0.0	1,683.3	84.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		1,50		
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	94.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10644

02-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

10,216

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

AHU4 System Number:

Typical Building Information

Category	Construction	Use	Occ.	Day
14	BRICK	ADM & SUPPLY,ENL BRK	0600-1700	MON-FRI

Enter Weeks of Summer:

Enter Weeks of Winter:

32	20	
	 32	

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700	1700	1700	1700	0

Present Operations	S	M	T	W	Ŧ	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		770
CFM - CLG		0
% OA		100.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	220.75	220.75
HOAOHC	110.07	110.07
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC		5.84E+03
NSC	4.86E+04	4.86E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10644

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	1,626.4	0.0	
Optimum ST/SP	0.0	56.9	0.0	
Duty Cycle	0.0	0.0	0.0	, , ,
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	84.5	
Sub Total	0.0	1,683.3	84.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	1,683.3	94.6	######################################

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10644

BLDG:

Building Sq.Ft.: System Type

30,648

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU5

Typical Building Information

rypical building information								
Category	Construction	Use	Occ.	Day				
15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT				

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		1300
CFM - CLG		0
% OA		100.00%
% Area		16.70%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

01-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10644

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	•
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	73.0	1700
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	73.0	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10644

Building Sq.Ft.: System Type

30,648

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

Typical Building Information

	Typical building information								
Category		Construction	Use	Occ.	Day				
	15	BRICK	ADM & SUPPLY, ENL BRK	0000-2400	SUN-SAT				

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.33
Load Factor	8.0
CFM - HTG	1060
CFM - CLG	0
% OA	100.00%
% Area	16.70%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 65	.00% 65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.40E+04	1.40E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

01-Apr-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

02-Apr-95 PAGE 2 OF 2

Bldg Number:

10644

System Type

.

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEM	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	73.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				
TOTAL	0.0	0.0	73.0	

ENERGY CALCULATIONS

BUILDING 10650

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10650

2000

2000

CHECKED BY: KC/WLC PAGE 1 OF 2

S 400

2000

2000

DATE:

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

Building Sq.Ft.:

Stop Time

12,578

2000

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: AHU1

Typical Building Information

		. , , ,			
Category		Construction	Use	Occ.	Day
	16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	
Start Time	400	400	400	400	400	400	

2000

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

2000

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		8000
CFM - CLG		0
% OA		100.00%
% Area		17.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

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Bldg Number:

10650

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	МН/уг
Schedule ST/SP	0.0	11,789.6	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	*
Night Setback	0.0	0.0	174.4	
Sub Total	0.0	12,801.7	174.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	63.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,801.7	237.4	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10650

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

06-Apr-95

EMC NO.: 1406-006

PAGE 1 OF 2

DATE:

Building Sq.Ft.: System Type

12,578

System Name:

H&V UNIT

System Number:

AHU2

Typical Building Information

	. , p	unung min		
Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	М	Т	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		8
Load Factor		0.8
CFM - HTG		5265
CFM - CLG		0
% OA		25.00%
% Area		17.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	hu 160 by niversió i libratión t
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HŘSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10650

System Type

2

System Name: System Number: H&V UNIT AHU2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	14,042.8	0.0	
Optimum ST/SP	0.0	1,079.5	0.0	77
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	200.8	
Sub Total	0.0	15,122.3	200.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	72.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	15,122.3	273.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10650

06-Арг-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

12,578

System Type

System Name:

H&V UNIT

System Number:

AHU3

Typical Building Information

	.,,,,,,,,,		,	
Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Start Time	0	0	0	0	0	0	0
	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	10
Load Factor	0.8
CFM - HTG	4670
CFM - CLG	0
% OA	100.00%
% Area	15.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 85.80°	% 85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10650

System Type

2

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	17,001.1	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	177.2	
Sub Total	0.0	18,308.0	177.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	64.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	18,308.0	241.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10650

Occ.

Day

0400-2400 SUN-SAT

06-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

12,578

System Type System Name:

H&V UNIT AHU4

System Number:

	Typical Building Information				
Category	Construction	Use			
16	BRICK	ENK PERS DINNING			

Enter Weeks of Summer: 20 **Enter Weeks of Winter:** 32

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT			
Motor HP	Motor HP				
Load Factor		0.8			
CFM - HTG	7430				
CFM - CLG	0				
% OA	5.00%				
% Area		24.00%			
TON CAPC.		0			
MBTU CAPC.		0			
kW/Ton		0			
MOSON		12			
EFF		1			
LOOK-UP VALUE					
EFFHP	86.70%	86.70%			

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HRSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10650

System Type

2

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	25,236.9	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	*
Night Setback	0.0	0.0	283.5	
Sub Total	0.0	27,177.0	283.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	102.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	27,177.0	385.9	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY** BLDG:

LOCATION: FT. DRUM

12,578

10650

06-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

System Type

H&V UNIT

System Name: System Number:

AHU5

Typical Building Information

Typioa: Danting in the second									
Category	Category Construction		Use	Occ.	Day				
	16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	1930	1930	1930	1930	1930	1930	1930

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	6
Load Factor	0.8
CFM - HTG	3145
CFM - CLG	0
% OA	5.00%
% Area	10.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	Annual COMP for the control of the
Cooling HRSON	2,422	3,360
Heating HRSON	3,875	5,376
C/H HRSON	6,314	8,760
Cooling HRSAV	938	
Heating HRSAV	1,501	
C/H HŘSAV	2,445	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	39.67	39.67
НОАОНС	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC		0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC		3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR		7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10650

System Type

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	10,725.7	0.0	-
Optimum ST/SP	0.0	824.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	118.1	
Sub Total	0.0	11,550.2	118.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	42.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	11,550.2	160.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

12,578

10650

06-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type

System Name:

CONVERTER AND PUMPS

HE1 System Number:

Typical Building Information

	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
Category	Construction	Use	Occ.	Day
16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		7.40%
TON CAPC.		0
MBTU CAPC.		1.5064
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HŘSAV	2,190	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10650

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HE1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,349.5	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	87.4	
Sub Total	0.0	3,637.0	87.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	31.6	
HW OA Reset	0.0	0.0	11.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	3,637.0	130.1	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10650

CHECKED BY: KC/WLC PAGE 1 OF 2

DATE:

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

06-Apr-95

Building Sq.Ft.:

12,578

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU6

Typical Building Information

	Typical Building Information						
	Category		Construction	Use	Occ.	Day	
Г	<u> </u>	16	BRICK	ENK PERS DINNING	0400-2400	SUN-SAT	

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	400	400	400	400	400	400	400
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		4
Load Factor		0.8
CFM - HTG		600
CFM - CLG		0
% OA		0.00%
% Area		1.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	2,520	3,360
Heating HRSON	4,032	5,376
C/H HRSON	6,570	8,760
Cooling HRSAV	840	
Heating HRSAV	1,344	
C/H HRSAV	2,190	

CONSTANT	LOOK-UP	INPUT
CONSTANT		Commenced to the comment of the
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	39.67	39.67
HOAOHC	24.34	24.34
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	3.39E+04	3.39E+04
NSC	9.39E+04	9.39E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10650

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,614.1	0.0	
Optimum ST/SP	0.0	567.8	0.0	
Duty Cycle	0.0	0.0	0.0	· · · · · · · · · · · · · · · · · · ·
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	18.9	
Sub Total	0.0	7,181.9	18.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.8	Manager 1, 1997
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	7,181.9	25.7	3

ENERGY CALCULATIONS

BUILDING 10660

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY** BLDG:

LOCATION: FT. DRUM

41,968

10660

Building Sq.Ft.: System Type

System Name:

System Number:

H&V UNIT

HV1

Typical Building Information

typical Building information								
Category	Construction	Use	Occ.	Day				
1	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700		700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Τ	W	TH	F	S
Start Time	0	0	0	0	0	0	
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	22.5
Load Factor	0.8
CFM - HTG	11135
CFM - CLG	0
% OA	33.00%
% Area	10.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
НОАОНС	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC		2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0_
CHWR		9.57
OAR		7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

04-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bidg Number:

10660

System Type

2

System Name:

H&V UNIT

System Number:

HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	38.9	
Sub Total	0.0	83,884.9	38.9	
Economizer	0.0	0.0	0.0	•
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	9.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	48.8	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

41,968

10660

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

04-Apr-95

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

System Type System Name:

H&V UNIT

System Number:

HV2

Typical Building Information

	Typical Ballang Information								
ſ	Category	Construction	Use	Occ.	Day				
ľ	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:

Enter Weeks of Winter:	32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		27.5
Load Factor		0.8
CFM - HTG		11410
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	89.40%	89.40%

HOURS CALCULATIONS	REQUIRED HR/YR	tra are see sees at 50 feet flight. I
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

10660

System Type

2

System Name:

H&V UNIT

System Number:

HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	97,585.7	0.0	•
Optimum ST/SP	0.0	3,449.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	38.9	
Sub Total	0.0	101,035.1	38.9	Managara .
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	9.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	101,035.1	48.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10660

DATE: 05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

41,968

System Type

H&V UNIT

System Name: System Number:

HV3

Typical Building Information

Typical Ballating Information									
Category Construction		Use	Occ.	Day					
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT					

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	LL.	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		22.5
Load Factor		0.8
CFM - HTG		6020
CFM - CLG		0
% OA		33.00%
% Area		10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
НОАОНС	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR		7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bidg Number:

10660

System Type

System Name:

H&V UNIT

System Number:

HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	•
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	38.9	
Sub Total	0.0	83,884.9	38.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	9.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	48.8	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10660

05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

41,968

System Type

H&V UNIT

System Name: System Number:

HV4

Typical Building Information

	typiod, Dattomy						
Category		Construction	Use	Occ.	Day		
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	22.5
Load Factor	0.8
CFM - HTG	4090
CFM - CLG	0
% OA	100.00%
% Area	5.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 88.10°	% 88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10660

System Type

2

System Name:

H&V UNIT

System Number:

HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	19.4	
Sub Total	0.0	83,884.9	19.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	5.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	24.4	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10660

05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

41,968

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-1

Typical Building Information

Typical Danaing internation							
Category		Construction	Use	Occ.	Day		
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		18150
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10660

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	23.3	
Sub Total	0.0	56,826.3	23.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	29.3	1. Tuza e pre 1. 4 4 3 1

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10660

Building Sq.Ft.: System Type

41,968

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-2

Typical Building Information

	lypical Building Information								
	Category	Construction	Use	Occ.	Day				
1	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		9200
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS	REQUIRED	PRESENT
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH		0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR		9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

05-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10660

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	11.7	
Sub Total	0.0	56,826.3	11.7	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	14.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10660

BLDG:

Building Sq.Ft.: System Type

41,968

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

MAU-3

	Typical Building Information							
	Category	Construction	Use	Occ.	Day			
ŀ	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16920
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH		0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH		15.77
НОАОНС	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR		9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

05-Apr-95 DATE:

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10660

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	23.3	
Sub Total	0.0	56,826.3	23.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	29.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10660

CHECKED BY: KC/WLC PAGE 1 OF 2

DATE:

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

05-Apr-95

Building Sq.Ft.:

41,968

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: MAU-4

Typical Building Information

Typical Dallang Internation									
Category		Construction	Use	Occ.	Day				
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	20000
CFM - CLG	0
% OA	100.00%
% Area	6.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 86.70%	86.70%

1.1 × 1.2 × 1.1 = 1.1 = 1.1 × 0.00 × 0.00	REQUIRED	
CALCULATIONS	HR/YR	HK/TK
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10660

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	23.3	
Sub Total	0.0	56,826.3	23.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	29.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY** BLDG:

LOCATION: FT. DRUM

10660

EMC NO.: 1406-006 DATE:

05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

41,968

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-5

Typical Building Information

Typical Zallang International Control of the Contro										
Category	Construction		Use	Occ.	Day					
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT					

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	45	S	М	Т	W	TH	F	S
Start Time		0	700	700	700	700	700	700
Stop Time		0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		10000
CFM - CLG		0
% OA		100.00%
% Area		3.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
HOAOHC	9.68	9.68
COAOC		0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10660

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	11.7	
Sub Total	0.0	56,826.3	11.7	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	14.6	3.

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10660

DATE: 05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.: 41,968

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU6

Typical Building Information

Typical Daniang morniage										
Category Construction		Use	Occ.	Day						
	18 BRICK	VEH MNT SHOP	0700-1900	SUN-SAT						

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	16100
CFM - CLG	0
% OA	100.00%
% Area	5.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
. MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 86	.70% 86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
. HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	. 7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10660

System Type

10000

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	19.4	
Sub Total	0.0	56,826.3	19.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	5.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	24.4	Village 1985 Sept. 3 14.

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10660

05-Арг-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

41,968

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

MAU-7

Typical Building Information

	Typical Bulluling Information								
Category		Construction	Use	Occ.	Day				
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	7.5
Load Factor	0.8
CFM - HTG	16100
CFM - CLG	0
% OA	100.00%
% Area	2.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 83.1	0% 83.10%

HOURS	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HUAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10660

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	28,632.0	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.8	
Sub Total	0.0	29,644.0	7.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	29,644.0	9.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10660

DATE: 05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

41,968

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HTP1

Typical Building Information

. y p. oz							
Category	Construction	Use	Occ.	Day			
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	i igasai s	1901.74	INPUT
Moto	5		
Load F	actor		0.8
CFM - I	HTG		0
CFM - 0	CLG		0
%	OA		0.00%
% /	24.00%		
TON CA	PC.		0
MBTU C	APC.		3.587
kV	//Ton		0
MO	SON		7
	1		
LOOK-UP VALUE			
EF	FHP _	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HŘSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH		0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC		2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10660

System Type

System Name:

12 **BASEBOARD RADIATION**

System Number:

HTP1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	93.3	
Sub Total	0.0	12,616.7	93.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	23.8	
HW OA Reset	0.0	0.0	26.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	143.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10660

CHE

DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

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EMC NO.: 1406-006

Building Sq.Ft.:

41,968

System Type

9

System Name:

CONVERTER AND PUMPS

System Number:

HTP2

Typical Building Information

		.,			
Cate	gory	Construction	Use	Occ.	Day
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	5
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	4.62
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP	81.60% 81.60%

HOURS	REQUIRED HR/YR	
CALCULATIONS		
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
, NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	. 7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10660

System Type

9

System Name:

CONVERTER AND PUMPS

System Number:

HTP2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	34.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	34.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10660

DATE: 05-Apr-95 PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

41,968

System Type

9

System Name:

CONVERTER AND PUMPS

System Number:

HTP3

Typical Building Information

Typiour Dunium 3 miles							1
Category		Construction	Use		Occ.	Day	
	18	BRICK	VEH MNT SHOP		0700-1900	SUN-SAT	

Enter Weeks of Summer:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	28 (19) NE	INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.258
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10660

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HTP3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	*
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	31.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	31.5	3

ENERGY CALCULATIONS

BUILDING 10670

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10670

EMC NO.: 1406-006

31-Mar-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

43,519

System Type

System Name:

H&V UNIT

System Number:

HV1

Typical Building Information

Typical Ballang Internation						
Category		Construction	Use	Occ.	Day	
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT	

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	22.5
Load Factor	0.8
CFM - HTG	11135
CFM - CLG	0
% OA	33.00%
% Area	10.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 88.	10% 88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10670

System Type

2

System Name:

H&V UNIT

System Number:

HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	40.3	
Sub Total	0.0	83,884.9	40.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	50.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10670

31-Mar-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

43,519

System Type System Name:

2 **H&V UNIT**

System Number:

HV2

Typical Building Information

., y prod. 2 dr. 5								
Category Constr		Construction	Use	Occ.	Day			
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		27.5
Load Factor	0.8	
CFM - HTG	11410	
CFM - CLG		0
% OA		33.00%
% Area	ļ	10.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	89.40%	89.40%

HOURS CALCULATIONS	REQUIRED HR/YR	
		3.360
Cooling HRSON	1,320	
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10670

Bldg Number: System Type

2

System Name:

H&V UNIT

System Number:

HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr	
Schedule ST/SP	0.0	97,585.7	0.0		
Optimum ST/SP	0.0	3,449.4	0.0		
Duty Cycle	0.0	0.0	0.0		
Demand Limit	0.0	0.0	0.0		
Night Setback	0.0	0.0	40.3		
Sub Total	0.0	101,035.1	40.3		
Economizer	0.0	0.0	0.0		
Ventilation/Recirculation	0.0	0.0	0.0		
DDC Control	0.0	0.0	10.3		
HW OA Reset	0.0	0.0	0.0		
Chilled Water Reset	0.0	0.0	0.0		
Condenser Water Reset	0.0	0.0	0.0		
Chiller Demand Limit	0.0	0.0	0.0		
Remote Monitoring, Maintenance,					
Run Time, and Safety Alarms				3	
TOTAL	0.0	101,035.1	50.6	3	

Date:

31-Mar-95 PAGE 2 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10670

1600

1600

31-Mar-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

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S 700

1600

1600

EMC NO.: 1406-006

43,519

Building Sq.Ft.:

2

System Type System Name:

Stop Time

H&V UNIT

System Number:

HV3

Typical Building Information

Typical Ballang Information								
Category		Construction	Use	Occ.	Day			
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

0

Enter Weeks of Summer:

20 32

1600

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	
Start Time	0	700	700	700	700	700	

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

1600

INPUTS	INPUT
Motor HP	22.5
Load Factor	0.8
CFM - HTG	6020
CFM - CLG	0
% OA	33.00%
% Area	10.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10670

System Type System Name:

System Number:

H&V UNIT HV3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	40.3	
Sub Total	0.0	83,884.9	40.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	10.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	50.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

43,519

10670

31-Mar-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type System Name:

2 **H&V UNIT**

System Number:

HV4

Typical Building Information

Typicar Banang morniacion						
Category		Construction	Use	Occ.	Day	
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT	

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	22.5
Load Factor	0.8
CFM - HTG	4090
CFM - CLG	0
% OA	33.00%
% Area	5.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10670

System Type

2

System Name: System Number: **H&V UNIT** HV4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	81,021.0	0.0	
Optimum ST/SP	0.0	2,863.9	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	20.1	
Sub Total	0.0	83,884.9	20.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	5.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	83,884.9	25.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10670

EMC NO.: 1406-006

05-Apr-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

43,519

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-1

Typical Building Information

		. , , ,				
Category	_	Construction Use		Occ.	Day	
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT	

Enter weeks of Summer:	20
Enter Weeks of Winter:	32
·	

Required Operation	S	M	T	W	TH	F	5
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		18150
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95

PAGE 2 OF 2

Bldg Number:

10670

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	·MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	,
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	24.2	
Sub Total	0.0	56,826.3	24.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	30.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10670

DATE:

31-Mar-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

43,519

Building Sq.Ft.: System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-2

Typical Building Information

Typical Dallating titletimation						
Category		Construction	Use	Occ.	Day	
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT	

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	9200
CFM - CLG	0
% OA	100.00%
% Area	3.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP	86.70% 86.70%

	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

31-Mar-95
PAGE 2 OF 2

Bldg Number:

10670

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	12.1	
Sub Total	0.0	56,826.3	12.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	15.2	- <u>- 3 - 3 - 3 - 4 - 3 - 4 - 4 - 4 - 4 - 4 </u>

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10670

31-Mar-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

43,519

Building Sq.Ft.: System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-3

Typical Building Information

	Typical Building information							
Category Construction		Use	Occ.	Day				
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16920
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10670

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	24.2	
Sub Total	0.0	56,826.3	24.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	30.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

31-Mar-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

43,519

10670

Building Sq.Ft.:

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: MAU-4

Typical Building Information

Typical Ballating Information						
Category	Construction	Use	Occ.	Day		
11	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	20000
CFM - CLG	0
% OA	100.00%
% Area	6.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP	86.70% 86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HŘSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC		0.00
COAUC		0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC		2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

31-Mar-95

PAGE 2 OF 2

Bldg Number: System Type 10670

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-4

1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	24.2	
Sub Total	0.0	56,826.3	24.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	6.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	·
Remote Monitoring, Maintenance,				<u>. </u>
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	30.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10670

DATE: 31-Mar-95 PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

43,519

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

MAU-5

Typical Building Information

Typical Dunaning Information						
Category	Construction	Use	Occ.	Day		
	18 BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS			INPUT
Mot	15		
Load	Factor		0.8
CFM	- HTG		10000
CFM	- CLG		0
	% OA		100.00%
%	Area		3.00%
TON C	CAPC.		0
MBTU	CAPC.		0
k	W/Ton		0
M	OSON		12
	EFF		1
LOOK-UP VALU	E		
E	FFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10670

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	12.1	
Sub Total	0.0	56,826.3	12.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	15.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

43,519

10670

31-Mar-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-6

Typical Building Information

Typical Dantaling						
Category		Construction	Use	Occ.	Day	
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT	

20
32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16100
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
· ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10670

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	20.1	
Sub Total	0.0	56,826.3	20.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	5.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	25.3	3 🔻

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10670

Building Sq.Ft.: System Type

43,519

MAU-7

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

Typical Building Information

Typical Building Information							
Category		Construction	Use	Occ.	Day		
5419.7	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600
Otop Time							

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	7.5
Load Factor	0.8
CFM - HTG	6840
CFM - CLG	0
% OA	100.00%
% Area	2.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 83.10%	83.10%

HOURS	REQUIRED	
CALCULATIONS	HR/YR_	HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

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31-Mar-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

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Bldg Number:

10670

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	28,632.0	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	8.1	
Sub Total	0.0	29,644.0	8.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	29,644.0	10.1	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10670

DATE:

31-Mar-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

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Building Sq.Ft.:

43,519

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HTP1

Typical Building Information

Typiout Danaing mornians							
Category		Construction	ction Use		Day		
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	\$5.5	INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		3.587
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
HOAOHC	9.68	9.68
COAOC		0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR		9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10670

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HTP1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr	
Schedule ST/SP	0.0	11,929.6	0.0		
Optimum ST/SP	0.0	687.1	0.0		
Duty Cycle	0.0	0.0	0.0		
Demand Limit	0.0	0.0	0.0		
Night Setback	0.0	0.0	96.7		
Sub Total	0.0	12,616.7	96.7		
Economizer	0.0	0.0	0.0		
Ventilation/Recirculation	0.0	0.0	0.0		
DDC Control	0.0	0.0	24.7		
HW OA Reset	0.0	0.0	26.5		
Chilled Water Reset	0.0	0.0	0.0		
Condenser Water Reset	0.0	0.0	0.0		
Chiller Demand Limit	0.0	0.0	0.0		
Remote Monitoring, Maintenance,					
Run Time, and Safety Alarms				3	}
TOTAL	0.0	12,616.7	147.9	3	}

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10670

BLDG:

Building Sq.Ft.: System Type

43,519 9

System Name:

CONVERTER AND PUMPS

System Number:

HTP2

Typical Building Information

	Typical Building information								
Γ	Category	Construction	Use	Occ.	Day				
ľ	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:

Enter Weeks of Winter:	32

S	M	T	W	TH	F	S
0	700	700	700	700	700	700
0	1600	1600	1600	1600	1600	1600
	0 0	0 700	0 700 700	0 700 700 700	0 700 700 700 700	0 700 700 700 700 700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.62
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED	PRESENT HR/YR
CALCULATIONS		
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

	000 - 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
. ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

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31-Mar-95

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

31-Mar-95

PAGE 2 OF 2

Bldg Number:

10670

System Type

9

System Name:

CONVERTER AND PUMPS

System Number:

HTP2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	34.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	34.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10670

BLDG:

Building Sq.Ft.: System Type

43,519

System Name:

CONVERTER AND PUMPS

System Number:

HTP3

Typical Building Information

Typical Building information								
Category	C	Construction	Use	Occ.	Day			
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer:

Enter Weeks of Winter:

32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.258
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+Ó0	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
НОАОНС	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC		2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR		9.57
OAR		7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

31-Mar-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

31-Mar-95 PAGE 2 OF 2

Bldg Number:

10670

System Type

9

System Name:

CONVERTER AND PUMPS

System Number:

HTP3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	31.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	31.5	1. 1. 3

ENERGY CALCULATIONS

BUILDING 10680

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10680

DATE: 05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

39,679

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: MAU-3

Typical Building Information

		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
Category		Construction	Use	Occ.	Day
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16920
CFM - CLG		0
% OA		100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		10
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
۴۷	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10680

System Type

....

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	11.0	***************************************
Sub Total	0.0	56,826.3	11.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	13.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

10680

Bidg Number: System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	1,52
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	22.0	
Sub Total	0.0	56,826.3	22.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	5.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	27.7	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10680

EMC NO.: 1406-006

05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

39,679

System Type

System Name:

System Number:

H&V UNIT WITHOUT RETURN FAN MAU-4

Typical Building Information

Typical Bullating Information								
Category	Construction	Use	Occ.	Day				
1:	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG	20000	
CFM - CLG		0
% OA	·	100.00%
% Area		6.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
НОАОНС	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10680

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	2000
Night Setback	0.0	0.0	22.0	
Sub Total	0.0	56,826.3	22.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	5.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		,		
Run Time, and Safety Alarms				3
	0.0	56,826.3	27.7	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

F

10680

DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

39,679

System Type

.....

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-5

Typical Building Information

.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,								
Category Construction		uction Use		Day				
18		VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	w	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	10000
CFM - CLG	0
% OA	100.00%
% Area	3.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF .	1
LOOK-UP VALUE	
EFFHP 86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Literature in the control of the con		
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
НОАОНС	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95

PAGE 2 OF 2

Bldg Number:

10680

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

MAU-5

HEATING AND VENTILATING SYSTEMS	kW/vr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	11.0	
Sub Total	0.0	56,826.3	11.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				_
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	13.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10680

DATE: 05-Арг-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

39,679

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

MAU6

Typical Building Information

- J prout = unung intermation						
Category	Construction	Use	Occ.	Day		
18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		16100
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS	REQUIRED	PRESENT
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	. 7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10680

System Type

.

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU6

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	54,886.2	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	H
Night Setback	0.0	0.0	18.4	
Sub Total	0.0	56,826.3	18.4	-31.
Economizer	0.0	0.0	0.0	1,100
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	4.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	56,826.3	23.1	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10680

EMC NO.: 1406-006

DATE: 05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

39,679

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-7

Typical Building Information

Typical Ballang Information								
Category		Construction	Use	Occ.	Day			
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600
Otop Timo							

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		16100
CFM - CLG		0
% OA		100.00%
% Area		2.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10680

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU-7

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	28,632.0	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	7.3	
Sub Total	0.0	29,644.0	7.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	1.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	29,644.0		3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10680

EMC NO.: 1406-006 DATE:

CHECKED BY: KC/WLC

05-Apr-95 PREPARED BY: CSW/BMG

PAGE 1 OF 2

Building Sq.Ft.:

39,679

System Type System Name:

12 **BASEBOARD RADIATION**

System Number:

HTP1

Typical Building Information

Typical Dallaring Information							
Category		Construction	Use	Occ.	Day		
	18	BRICK	VEH MNT SHOP	0700-1900	SUN-SAT		

Enter Weeks of C

20 32

Enter weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	e la la ce	INPUT
Motor HP	5	
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area	24.00%	
TON CAPC.		0
MBTU CAPC.		3.587
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
НОАОНС	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10680

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HTP1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	88.2	
Sub Total	0.0	12,616.7	88.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	22.5	
HW OA Reset	0.0	0.0	26.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0,0	12,616.7	137.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10680

Building Sq.Ft.:

39,679

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HTP2

Typical Building Information

Category	Construction	Use	Occ.	Day	
18		VEH MNT SHOP	0700-1900	SUN-SAT	

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	5
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	4.62
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	15.77	15.77
НОАОНС	9.68	9.68
COAOC	0.00E+00	0.00E+00
СОАОНС	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

05-Apr-95

DATE:

PAGE 1 OF 2

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10680

System Type

9 **CONVERTER AND PUMPS**

System Name: System Number:

HTP2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	34.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	34.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10680

EMC NO.: 1406-006

DATE: 05-Apr-95

PREPARED BY: CSW/BMG

CHECKED BY: CSW/BM

PAGE 1 OF 2

Building Sq.Ft.:

System Type

39,679

, , ,

System Name: System Number: CONVERTER AND PUMPS HTP3

Typical Building Information

Typical Bullating information								
Category	Construction	Use	Occ.	Day				
18		VEH MNT SHOP	0700-1900	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	700
Stop Time	0	1600	1600	1600	1600	1600	1600

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	. 0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	2124 B [INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		4.258
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED	PRESENT HR/YR
	HIVIK	
Cooling HRSON	1,320	3,360
Heating HRSON	2,112	5,376
C/H HRSON	3,441	8,760
Cooling HRSAV	2,040	
Heating HRSAV	3,264	
C/H HRSAV	5,319	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	15.77	15.77
HOAOHC	9.68	9.68
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.36E+03	2.36E+03
NSC	9.26E+03	9.26E+03
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10680

System Type

9

System Name:

CONVERTER AND PUMPS

System Number:

HTP3

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	11,929.6	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	12,616.7	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	31.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,616.7	31.5	3

ENERGY CALCULATIONS

BUILDING 10690

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

400

10690

EMC NO.: 1406-006

06-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

DATE:

Building Sq.Ft.:

26,400

System Type

4

System Name:

SINGLE ZONE AHU

System Number:

AHU-1

Typical Building Information

	. , , ,			
Category	Construction	Use	Occ.	Day
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		20
Load Factor		0.8
CFM - HTG		11000
CFM - CLG		11000
% OA		9.00%
% Area		43.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		0
EFF		1
LOOK-UP VALUE		
EFFHP	88.10%	88.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
НОАОН	14.77	14.77
HOAOHC		9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number: System Type

10690

System Name:

SINGLE ZONE AHU

System Number: AHU-1

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	69,236.5	0.0	
Optimum ST/SP	0.0	2,545.7	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	27.1	0.0	0.0	
Night Setback	0.0	0.0	685.2	
Sub Total	27.1	71,782.2	685.2	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	1.5	1.0	
DDC Control	0.0	0.0	100.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	27.1	71,783.7	786.2	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

26,400

10690

EMC NO.: 1406-006 DATE: 06-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HV1

Typical Building Information

.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
Category	Construction	Use	Occ.	Day			
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI			

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH_	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT		
Motor HP		· 1		
Load Factor		0.8		
CFM - HTG		2040		
CFM - CLG		0		
% OA	% OA			
% Area		10.60%		
TON CAPC.		0		
MBTU CAPC.		0		
kW/Ton		0		
MOSON		12		
EFF		1		
LOOK-UP VALUE				
EFFHP	69.20%	69.20%		

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
НОАОН	14.77	14.77
НОАОНС	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHO	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10690

System Type System Name: 1 H&V UNIT WITHOUT RETURN FAN

System Number:

HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,404.6	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	167.0	
Sub Total	0.0	4,566.7	167.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.7	
DDC Control	0.0	0.0	24.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,566.7	192.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10690

EMC NO.: 1406-006

DATE: 06-Арг-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

26,400

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

HV2 System Number:

Typical Building Information

177						
Category	Construction	Use	Occ.	Day		
	IO BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI		

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		3300
CFM - CLG		0
% OA		100.00%
% Area		34.20%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
НОАОН	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHO	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	- 188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10690

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number: HV2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	7,815.4	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	538.7	
Sub Total	0.0	8,103.0	538.7	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	78.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		-		
Run Time, and Safety Alarms				3
TOTAL	0.0	8,103.0	617.3	31

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

26,400

BLDG:

Building Sq.Ft.:

System Type System Name: 11

System Number:

CONDENSING UNIT

DC1

10690

Typical Building Information

Typical Bullating Information					
Category	Construction	Use	Occ.	Day	
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI	

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	31.75
MBTU CAPC.	0
kW/Ton	0
MOSON	5
EFF	1
LOOK-UP VALUE	
	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
НОАОНС	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHO	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

06-Apr-95

DATE:

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10690

System Type

11

System Name:

CONDENSING UNIT

System Number:

DC1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	303.8	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	303.8	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10690

EMC NO.: 1406-006 06-Apr-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

26,400

System Type

11

System Name:

CONDENSING UNIT

System Number:

DC3

Typical Building Information

Typious Daniang mornians							
Category Construction		Use	Occ.	Day			
	10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		11.2
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC		2.17E-05
COAUHC	8.32E-06	8.32E-06
НОАОН	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHO	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
F√	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bidg Number:

10690

System Type

11

System Name:

CONDENSING UNIT

System Number: De

DC3

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	107.2	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	107.2	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10690

EMC NO.: 1406-006

CHECKED BY: KC/WLC

DATE: 06-Apr-95 PREPARED BY: CSW/BMG

PAGE 1 OF 2

Building Sq.Ft.:

26,400

System Type
System Name:

11 CONDENSING UNIT

System Number:

CU-1

Typical Building Information

	Typical Daniang							
Category Constr		Construction	Use	Occ.	Day			
	10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI			

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		25.3
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10690

System Type

11 **CONDENSING UNIT**

System Name: System Number:

CU-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	242.1	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	242.1	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10690

EMC NO.: 1406-006

06-Apr-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

Building Sq.Ft.:

26,400

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

BLDG:

System Number:

AC1

Typical Building Information

	, , p.ou. 2	ananig incommen			1
Category	Construction	Use	Occ.	Day	
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI	

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	3
Load Factor	0.8
CFM - HTG	0
CFM - CLG	5400
% OA	100.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	5
EFF	1
LOOK-UP VALUE	
EFFHP 79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
НОАОН	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

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Bldg Number:

10690

System Type

3

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number: AC1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,669.3	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,095.1	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,095.1	0.0	3.4

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10690

EMC NO.: 1406-006

06-Apr-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

AC3

26,400

Typical Building Information

Typical Danaing Internation								
Category Construction		Use	Occ.	Day				
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI				

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor	0.8	
CFM - HTG	0	
CFM - CLG	5400	
% OA	100.00%	
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
НОАОН	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHO	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10690

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

AC3

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,669.3	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,095.1	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms			·	3
TOTAL	0.0	5,095.1	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10690

EMC NO.: 1406-006

DATE: 06-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type

26,400

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

AC5

Typical Building Information

Typical Ballanig Internation							
Category	Construction	Use	Occ.	Day			
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI			

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		
CFM - CLG		5400
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
НОАОН	14.77	14.77
НОАОНС	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHO	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10690

System Type

SINGLE ZONE AHU WITHOUT RETURN FAN

System Name: System Number:

AC5

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,669.3	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	5,095.1	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	5,095.1	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

400

10690

EMC NO.: 1406-006

DATE: 06-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

26,400

System Type

Туре

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

BLDG:

System Number:

AC7

Typical Building Information

Typical Dallating Intermediation						
Category Construction		Use	Occ.	Day		
	10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI	

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4300
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	1

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
НОАОН	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHO	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10690

System Type

3

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number: AC7

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,180.6	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	3,468.1	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	3,468.1	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

20 400

10690

EMC NO.: 1406-006

DATE: 06-Apr-95

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

26,400

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

BLDG:

System Number:

AC8

Typical Building Information

	. y p.ou				1
Category	Construction	Use	Occ.	Day	l
10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI	

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0
Otop Title							

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		4300
% OA		100.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
НОАОН	14.77	14.77
HOAOHC	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHO	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	6	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10690

System Type
System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

AC8

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	3,180.6	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	3,468.1	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	3,468.1	0.0	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

26,400

10690

EMC NO.: 1406-006

06-Apr-95 DATE:

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type

3

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

BLDG:

System Number:

AC9

Typical Building Information

. , , , , , , , , , , , , , , , , , , ,							
Category		Construction	Use	Occ.	Day		
	10	BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI		

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	М	T	w	TH	FF	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS			INPUT			
Mo	5					
Load	Factor		0.8			
CFM	- HTG		0			
CFM	- CLG		8100			
	% OA					
0	% Area					
TON	CAPC.		0			
MBTU	CAPC.		0			
ŀ	:W/Ton		0			
N	IOSON		5			
	EFF		1			
LOOK-UP VALU	E					
E	FFHP	81.60%	81.60%			

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT		
HOAUH	0.00	0.00		
HOAUHC	0.00	0.00		
COAUC	2.17E-05	2.17E-05		
COAUHC	8.32E-06	8.32E-06		
НОАОН	14.77	14.77		
HOAOHC	9.07	9.07		
COAOC	2.10E-05	2.10E-05		
COAOHC	8.04E-06	8.04E-06		
DC DUTY	0.00	0.00		
DC DEMAND	0.17	0.17		
ECC	0.00E+00	0.00E+00		
ECHC	0.00E+00	0.00E+00		
NSUCC	1.26E-05	1.26E-05		
NSUCHC	7.74E-06	7.74E-06		
DDCCHC	0.00E+00	0.00E+00		
DDCCC	0.00E+00	0.00E+00		
DSC	8.71E+03	8.71E+03		
NSC	5.97E+04	5.97E+04		
FV	6	6		
CHWR	9.57	9.57		
OAR	7.40	7.40		
OPT	188.00	188.00		

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10690

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number: AC9

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	7,508.1	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	8,195.2	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	en, fileta e die see te re 0.0	8,195.2	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10690

EMC NO.: 1406-006

DATE: 06-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

26,400

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HX1

Typical Building Information

. 7								
Category	Construction	Use	Occ.	Day				
	10 BRICK	DIV CMD/CNTRL BUILDING	600-1800	MON-FRI				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.59
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	2.17E-05	2.17E-05
COAUHC	8.32E-06	8.32E-06
HOAOH	14.77	14.77
НОАОНС	9.07	9.07
COAOC	2.10E-05	2.10E-05
COAOHC	8.04E-06	8.04E-06
DC DUTY	0.00	0.00
. DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	1.26E-05	1.26E-05
NSUCHC	7.74E-06	7.74E-06
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	8.71E+03	8.71E+03
NSC	5.97E+04	5.97E+04
FV	0	6
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

06-Apr-95 PAGE 2 OF 2

Bldg Number:

10690

System Type System Name:

CONVERTER AND PUMPS

System Number:

HX1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	4.4	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	4.4	3

ENERGY CALCULATIONS

BUILDING 10710

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10710

EMC NO.: 1406-006

DATE: 07-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

5,900

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

HV1

Typical Building Information

. , , , , , , , , , , , , , , , , , , ,						
Category	Construction	Use	Occ.	Day		
19	BRICK	POST SAFETY/LEA 1ST FL	0000-2400	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	FF	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		90.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	3.67E-07	3.67E-07
ECHC	1.23E-07	1.23E-07
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	6.04E-06	6.04E-06
DDCCC	1.81E-05	1.81E-05
DSC	4.06E+03	4.06E+03
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

07-Apr-95 PAGE 2 OF 2

Bldg Number:

10710

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

HV1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	21.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	21.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10710

EMC NO.: 1406-006

07-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

5,900

System Type

System Name:

CONVERTER AND PUMPS

System Number:

C1

Typical Building Information

Typical Ballang Information							
Category	Category Construction Use		Occ.	Day			
	9 BRICK	POST SAFETY/LEA 1ST FL	0000-2400	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.226
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	3.67E-07	3.67E-07
ECHC	1.23E-07	1.23E-07
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	6.04E-06	6.04E-06
DDCCC	1.81E-05	1.81E-05
DSC	4.06E+03	4.06E+03
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

07-Apr-95 PAGE 2 OF 2

Date:

Bldg Number: System Type

10710

System Name:

CONVERTER AND PUMPS

System Number:

C1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	1.7	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	1.7	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

5,900 12 10710

EMC NO.: 1406-006 DATE:

DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type

12 BASEBOARD RADIATION

System Name: System Number:

RAD

Typical Building Information

Typical Ballania Intermedia					
Category	Construction	Use	Occ.	Day	
	19 BRICK	POST SAFETY/LEA 1ST FL	0000-2400	SUN-SAT	

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT		
Motor HP	Motor HP			
Load Factor		0.8		
CFM - HTG		0		
CFM - CLG	0			
% OA		0.00%		
% Area		10.00%		
TON CAPC.		0		
MBTU CAPC.		0		
kW/Ton		0		
MOSON		7		
EFF		1		
LOOK-UP VALUE				
EFFHP	65.00%	65.00%		

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	1

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
НОАОНС	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	3.67E-07	3.67E-07
ECHC		1.23E-07
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	6.04E-06	6.04E-06
DDCCC	1.81E-05	1.81E-05
DSC	4.06E+03	4.06E+03
NSC	0.00E+00	0.00E+00
F۷	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

07-Apr-95 PAGE 2 OF 2

Bldg Number:

10710

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

RAD

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	2.4	3

ENERGY CALCULATIONS

BUILDING 10715

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

12,020

10715

DATE: 28-Mar-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HX1

Typical Building Information

.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
Category	Construction	Use	Occ.	Day			
20	BRICK	POST SAFETY/LEA 2ND F	0600-1700	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1600	1600	1600	1600	1600	0

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		6
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		18.00%
TON CAPC.		0
MBTU CAPC.		0.96
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,100	3,360
Heating HRSON	1,760	5,376
C/H HRSON	2,868	8,760
Cooling HRSAV	2,260	
Heating HRSAV	3,616	
C/H HRSAV	5,892	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	196.36	196.36
HOAOHC		97.91
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+03	1.18E+03
NSC	2.16E+04	2.16E+04
FV	321	321
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10715

System Type System Name: 12 BASEBOARD RADIATION

System Number:

HX1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	15,859.4	0.0	
Optimum ST/SP	0.0	824.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	46.7	
Sub Total	0.0	16,683.9	46.7	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	2.6	
HW OA Reset	0.0	0.0	7.1	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	16,683.9	56.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

20 577

10715

DATE: 28-Mar-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

20,577

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HVU-1

Typical Building Information

Typical banang morniana.							
Category	Construction	Use	Occ.	Day			
19	BRICK	POST SAFETY/LEA 1ST FL	0000-2400	SUN-SAT			

Enter Weeks of Summer: Enter Weeks of Winter: 20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	. Lawy La	INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		7760
CFM - CLG		0
% OA		40.59%
% Area		24.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
НОАОНС	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	3.67E-07	3.67E-07
ECHC	1.23E-07	1.23E-07
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	6.04E-06	6.04E-06
DDCCC	1.81E-05	1.81E-05
DSC	4.06E+03	4.06E+03
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10715

System Type

....

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HVU-1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	V
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	, , , , , , , , , , , , , , , , , , , ,
DDC Control	0.0	0.0	20.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	***************************************
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	20.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10715

EMC NO.: 1406-006

28-Mar-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

20,577

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HVU-2

Typical Building Information

Typical Ballanig Information						
Category	Construction	Use	Occ.	Day		
19	BRICK	POST SAFETY/LEA 1ST FL	0000-2400	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	114.14	INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		8230
CFM - CLG		0
% OA		16.04%
% Area		60.60%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
СОАОНС	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	3.67E-07	3.67E-07
ECHC		1.23E-07
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	6.04E-06	6.04E-06
DDCCC	1.81E-05	1.81E-05
DSC	4.06E+03	4.06E+03
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10715

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HVU-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	50.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	W. W. Charles
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	146
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	50.7	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

12,020

10715

BLDG:

Building Sq.Ft.: System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HVU-3

Typical Building Information

Typical building information								
Category	Construction	Use	Occ.	Day				
20	BRICK	POST SAFETY/LEA 2ND F	0600-1700	MON-FRI				

Enter Weeks of Summer:

Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1700	1700		1700	1700	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	1, 12, 4	INPUT				
Motor HP		15				
Load Factor		0.8				
CFM - HTG		9040				
CFM - CLG		0				
% OA		11.06%				
% Area		82.00%				
TON CAPC.		0				
MBTU CAPC.		0				
kW/Ton		0				
MOSON		12				
EFF		1				
LOOK-UP VALUE	LOOK-UP VALUE					
EFFHP	86.70%	86.70%				

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	,
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	196.36	196.36
HOAOHC	97.91	97.91
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.18E+03	1.18E+03
NSC	2.16E+04	2.16E+04
FV	321	321
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

28-Mar-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10715

System Type

.

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HVU-3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	55,424.3	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	213.0	
Sub Total	0.0	57,364.4	213.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	51.3	
DDC Control	0.0	0.0	11.6	
HW OA Reset	0.0	0.0	0.0	***
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	57,364.4	275.9	3 4 4 3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG: 20,577

10715

28-Mar-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

System Type

System Name:

CONVERTER AND PUMPS

9

System Number:

HX2

Typical Building Information

	· j			
Category	Construction	Use	Occ.	Day
19	BRICK	POST SAFETY/LEA 1ST FL	0000-2400	SUN-SAT

20 32

Enter Weeks of Summer: Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT				
Motor HP	1					
Load Factor	Load Factor					
CFM - HTG		0				
CFM - CLG		0				
% OA	0.00%					
% Area	8.40%					
TON CAPC.		0				
MBTU CAPC.		0.8418				
kW/Ton		0				
MOSON		7				
EFF	1					
LOOK-UP VALUE						
EFFHP	69.20%	69.20%				

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	3.67E-07	3.67E-07
ECHC		1.23E-07
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	6.04E-06	6.04E-06
DDCCC	1.81E-05	1.81E-05
DSC	4.06E+03	4.06E+03
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10715

9

System Type System Name:

CONVERTER AND PUMPS

System Number:

HX2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	162.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	162.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	7.0	
HW OA Reset	0.0	0.0	6.2	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		·		
Run Time, and Safety Alarms				3
TOTAL	0.0	162.0	13.3	3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

20,577

10715

Building Sq.Ft.: System Type

4

System Name:

SINGLE ZONE AHU

System Number:

ACU-1

Typical Building Information								
Category		Construction	Use	Occ.	Day			
	19	BRICK	POST SAFETY/LEA 1ST FL	0000-2400	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.33
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		100.00%
% Area		5.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	3.67E-07	3.67E-07
ECHC	1.23E-07	1.23E-07
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	6.04E-06	6.04E-06
DDCCC	1.81E-05	1.81E-05
DSC	4.06E+03	4.06E+03
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR		9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

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28-Mar-95

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10715

System Type

System Name:

SINGLE ZONE AHU

System Number:

ACU-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	***************************************
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.6	0.0	0.0	
Night Setback	0.0	0.0	0.0	1.77.111.
Sub Total	0.6	0.0	0.0	,,
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	4.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.6	0.0	4.2	3

ENERGY CALCULATIONS

BUILDING 10730

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10730

29-Mar-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

76,848

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

BLDG:

System Number:

AHU1

Typical Building Information

	. , p									
Category Construction		Use	Occ.	Day						
	2.	BRICK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT					

Enter Weeks of Summer:

20

Litter Weeks of Califfice.	
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	1000	1000	1000	1000	1000	1000	1000
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	. * 1.		INPUT
Motor HP			30
Load Factor			0.8
CFM - HTG			19350
CFM - CLG			19350
% OA	•		17.00%
% Area			5.80%
TON CAPC.			0
MBTU CAPC.			0
kW/Ton			0
MOSON			12
EFF			1
LOOK-UP VALUE			
EFFHP		90.20%	90.20%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH		0.00
HOAUHC	0.00	0.00
COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
НОАОН	214.18	214.18
НОАОНС	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

29-Mar-95 PAGE 2 OF 2

Bldg Number: System Type 10730

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

AHU1

3

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	97,044.3	0.0	
Optimum ST/SP	0.0	3,729.7	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	61.2	
Sub Total	0.0	100,773.9	61.2	
Economizer	0.0	1,911.2	0.0	
Ventilation/Recirculation	0.0	435.7	68.4	
DDC Control	0.0	18,640.1	20.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	Participate And America
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	121,760.9	150.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10730

29-Mar-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

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Building Sq.Ft.:

System Type

76,848 3

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number: AHU2

Typical Building Information

Category	Construction	Use	Occ.	Day
21	BRICK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	1000	1000	1000	1000	1000	1000	1000
Ston Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	М	Τ	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	10
Load Factor	0.8
CFM - HTG	7800
CFM - CLG	7800
% OA	17.79%
% Area	2.80%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 85	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
НОАОН	214.18	214.18
HOAOHC	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

29-Mar-95 PAGE 2 OF 2

Bldg Number:

10730

System Type System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	34,732.3	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	29.5	
Sub Total	0.0	36,039.3	29.5	W. 17
Economizer	0.0	770.4	0.0	
Ventilation/Recirculation	0.0	183.8	28.9	
DDC Control	0.0	7,513.8	10.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	44,507.4	68.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10730

EMC NO.: 1406-006

29-Mar-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

76,848

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

AHU3

Typical Building Information

Typica: Daniang me						
Category	Construction	nstruction Use		Day		
	21 BRICK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	1000	1000	1000	1000	1000	1000	1000
Stop Time	2000	2000	2000	2000	2000	2000	2000

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	5
Load Factor	0.8
CFM - HTG	0
CFM - CLG	4000
% OA	12.00%
% Area	0.96%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
HOAOH	214.18	214.18
HOAOHC	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

29-Mar-95 PAGE 2 OF 2

Bldg Number:

10730

System Type System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	17,489.5	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	10.1	
Sub Total	0.0	18,176.6	10.1	
Economizer	0.0	395.1	0.0	
Ventilation/Recirculation	0.0	63.6	0.0	
DDC Control	0.0	3,853.3	3.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	11.0
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	22,488.5	13.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10730

DATE: 29-Mar-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

76,848

System Type

3

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

BLDG:

System Number:

AHU4

Typical Building Information

Typical Ballang Internation						
Category Construction Use		Occ.	Day			
	21 BRIG	CK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT	

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	1000	1000	1000	1000	1000	1000	1000
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		7480
CFM - CLG		7480
% OA		6.09%
% Area		1.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
НОАОН	214.18	214.18
HOAOHC	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC		2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

29-Mar-95 PAGE 2 OF 2

10730

Bldg Number: System Type

10700

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	31,855.2	0.0	•
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	10.5	
Sub Total	0.0	33,162.1	10.5	
Economizer	0.0	738.8	0.0	
Ventilation/Recirculation	0.0	60.3	9.5	
DDC Control	0.0	7,205.6	3.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TANK TOTAL	0.0	41,166.8	23.6	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

76,848

10730

29-Mar-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.: System Type

SINGLE ZONE AHU WITHOUT RETURN FAN

BLDG:

System Name: System Number:

AHU5

Typical Building Information

Category		Construction	Use	Occ.	Day
	21	BRICK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT

Enter Weeks of Summer:

20

Filter Mecks of Califfic	
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	1000	1000	1000	1000	1000	1000	1000
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		15
Load Factor		0.8
CFM - HTG		0
CFM - CLG		8500
% OA		9.69%
% Area		1.63%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
НОАОН	214.18	214.18
HOAOHC	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

29-Mar-95 PAGE 2 OF 2

Bldg Number: System Type 10730

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	47,740.9	0.0	<u>.</u>
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	17.2	
Sub Total	0.0	49,681.0	17.2	The transfer that the same to
Economizer	0.0	839.5	0.0	
Ventilation/Recirculation	0.0	109.0	0.0	
DDC Control	0.0	8,188.2	5.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	58,817.7	23.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10730

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

29-Mar-95

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

76,848

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

AHU6 System Number:

Typical Building Information

Typical Danielly									
Category	Construction	Use	Occ.	Day					
2	1 BRICK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT					

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	1000	1000	1000	1000	1000	1000	1000
Stop Time	2000	2000	2000	2000	2000	2000	2000

BLDG:

Present Operations	S	M	Т	w	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	1855. s			INPUT			
Moto	3						
Load F	actor			0.8			
CFM -	HTG			1670			
CFM -	CFM - CLG						
9	6 OA			11.98%			
%	Area			0.24%			
TON C	APC.			0			
MBTU C	APC.			0			
kV	V/Ton	1		0			
MC	SON	1		12			
	EFF			1			
LOOK-UP VALUE							
EF	FHP		79.00%	79.00%			

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
HOAOH	214.18	214.18
HOAOHC	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

29-Mar-95 PAGE 2 OF 2

Bldg Number: System Type

10730

3

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	10,538.3	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	2.5	
Sub Total	0.0	10,964.1	2.5	
Economizer	0.0	164.9	0.0	***************************************
Ventilation/Recirculation	0.0	26.5	4.2	
DDC Control	0.0	1,608.7	0.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,	11 11 11 11 11 11 11 11 11 11 11 11 11			
Run Time, and Safety Alarms				3
TOTAL	0.0	12,764.3	7.5	3.0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10730

DATE: 29-Mar-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

76,848

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

BLDG:

System Number:

AHU7

Typical Building Information

	Typical Dunding Historical								
Category Construction		Use	Occ.	Day					
	21	BRICK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	1000	1000	1000	1000	1000	1000	1000
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT					
Motor HP	Motor HP						
Load Factor	0.8						
CFM - HTG		900					
CFM - CLG	1000						
% OA	11.11%						
% Area		0.12%					
TON CAPC.		0					
MBTU CAPC.		0					
kW/Ton		0					
MOSON		12					
EFF		1					
LOOK-UP VALUE							
EFFHP	78.00%	78.00%					

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
HOAOH	214.18	214.18
НОАОНС	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

29-Mar-95 PAGE 2 OF 2

Bldg Number:

10730

System Type

SINGLE ZONE AHU WITHOUT RETURN FAN

System Name: System Number:

AHU7

3

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	7,041.8	0.0	<u> </u>
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	1.3	
Sub Total	0.0	7,329.3	1.3	
Economizer	0.0	98.8	0.0	
Ventilation/Recirculation	0.0	14.7	2.1	
DDC Control	0.0	963.3	0.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,406.1	3.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10730

29-Mar-95 DATE: PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

76,848

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

BLDG:

System Number:

AHU8

Typical Building Information

	Typion Duning mounts								
Category Construction		Use	Occ.	Day					
	2.	BRICK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	1000	1000	1000	1000	1000	1000	1000
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		7.5
Load Factor		0.8
CFM - HTG		4600
CFM - CLG		4600
% OA		11.80%
% Area		1.47%
TON CAPC.		0
MBTU CAPC.	-	0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	83.10%	83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	1
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
НОАОН	214.18	214.18
HOAOHC	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

29-Mar-95 PAGE 2 OF 2

Bldg Number: System Type

10730

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

8UHA

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	25,254.1	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	15.5	
Sub Total	0.0	26,266.2	15.5	
Economizer	0.0	454.3	0.0	
Ventilation/Recirculation	0.0	71.9	11.3	
DDC Control	0.0	4,431.2	5.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	31,223.7	32.1	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10730

DATE:

EMC NO.: 1406-006

29-Mar-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

76,848

System Type

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

BLDG:

System Number:

AHU9

Typical Building Information

		. , , , , , , , , , ,			
Category		Construction	Use	Occ.	Day
	21	BRICK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	w	TH	F	S
Start Time	1000	1000	1000	1000	1000	1000	1000
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	Т	W	Ŧ	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	5
Load Factor	0.8
CFM - HTG	3495
CFM - CLG	3495
% OA	13.84%
% Area	1.47%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 81.	60% 81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	- "
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
HOAOH	214.18	214.18
НОАОНС	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR		9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

29-Mar-95 PAGE 2 OF 2

Bldg Number:

10730

System Type System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	17,501.4	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	15.5	
Sub Total	0.0	18,188.5	15.5	
Economizer	0.0	345.2	0.0	WWW. TO SAME AND AND AND AND AND AND AND AND AND AND
Ventilation/Recirculation	0.0	64.1	10.1	
DDC Control	0.0	3,366.8	5.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	21,964.6	30.8	3.

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10730

DATE: 29-Mar-95

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

76,848

System Type

3

System Name:

SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

AHU10

Typical Building Information

i j prout During time time.							
Category	Construction		Use	Occ.	Day		
	21	BRICK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT		

20 32

Enter Weeks of Summer:	
Enter Weeks of Winter:	

Required Operation	S	M	Т	W	TH	F	S
Start Time	1000	1000	1000	1000	1000	1000	1000
Stop Time	2000	2000	2000	2000	2000	2000	2000

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	_ 2
Load Factor	0.8
CFM - HTG	1800
CFM - CLG	1800
% OA	10.00%
% Area	0.44%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
. COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
HOAOH	214.18	214.18
HOAOHC	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

29-Mar-95 PAGE 2 OF 2

Bldg Number: System Type 10730

System Name:

3 SINGLE ZONE AHU WITHOUT RETURN FAN

System Number:

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	7,254.3	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	4.7	
Sub Total	0.0	7,541.9	4.7	
Economizer	0.0	177.8	0.0	
Ventilation/Recirculation	0.0	23.8	3.7	
DDC Control	0.0	1,734.0	1.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		· · ·		
Run Time, and Safety Alarms				3
TOTAL	0.0	9,477.4	10.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10730

DATE: 29-Mar-95

EMC NO.: 1406-006

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

76,848

12

System Type System Name:

BASEBOARD RADIATION

System Number:

HE1

Typical Building Information

Typical Banang morning							
Category		Construction	Use	Occ.	Day		
	21	BRICK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT		

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	1000	1000	1000	1000	1000	1000	1000
Stop Time	2000	2000	2000	2000	2000	2000	2000

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	10	
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		84.00%
TON CAPC.		0
MBTU CAPC.		2.101
kW/Ton		0
MOSON		8
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
HOAOH	214.18	214.18
HOAOHC	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC		1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

29-Mar-95 PAGE 2 OF 2

Bldg Number: System Type

10730

System Name:

12 **BASEBOARD RADIATION**

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	18,686.9	0.0	
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	886.0	
Sub Total	0.0	19,993.9	886.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	-
DDC Control	0.0	0.0	301.1	
HW OA Reset	0.0	0.0	15.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	19,993.9	1,202.7	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10730

29-Mar-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

76,848

System Type

11 **CONDENSING UNIT**

System Name: System Number:

CH1

Typical Building Information

	rypical ballating information							
Category		Construction	Use	Occ.	Day			
	21	BRICK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	1000	1000	1000	1000	1000	1000	1000
Stop Time	2000	2000	2000	2000	2000	2000	2000

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		95
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
НОАОН	214.18	214.18
НОАОНС	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

29-Mar-95 PAGE 2 OF 2

Bldg Number: System Type 10730

System Name:

11 CONDENSING UNIT

System Number:

CH1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	***************************************
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	7.770
Ventilation/Recirculation	0.0	0.0	0.0	THE PARTY OF THE P
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	909.2	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				THE PERSON NAMED OF THE PE
Run Time, and Safety Alarms				3
TOTAL	0.0	909.2	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10730

29-Mar-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

76,848

System Type

11

System Name:

CONDENSING UNIT

System Number:

CH2

Typical Building Information

Category	Construction	Use	Occ.	Day
2		CLO SALES/RETAIL/COM	1000-2000	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

S	M	T	W	TH	F	S
1000	1000	1000	1000	1000	1000	1000
2000	2000	2000	2000	2000	2000	2000
				1000 1000 1000 1000	1000 1000 1000 1000 1000	1000 1000 1000 1000 1000 1000

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		95
MBTU CAPC.		0
kW/Ton		0
MOSON		. 5
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,680	3,360
Heating HRSON	2,688	5,376
C/H HRSON	4,380	8,760
Cooling HRSAV	1,680	
Heating HRSAV	2,688	
C/H HRSAV	4,380	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
HOAOH	214.18	214.18
HOAOHC	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

29-Mar-95 PAGE 2 OF 2

Bldg Number: System Type

10730 11

System Name:

CONDENSING UNIT

System Number:

CH2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	7746
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	7.770.770.51.47
Ventilation/Recirculation	0.0	0.0	0.0	5 6 A
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	15.01.1
Chilled Water Reset	0.0	909.2	0.0	100000000000000000000000000000000000000
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	909.2	0.0	3

ENERGY CALCULATIONS

BUILDING 10732

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10732

EMC NO.: 1406-006

10-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.: System Type

4,000

System Name:

SINGLE ZONE AHU

System Number:

AHU1

*PROPANE IN-DUCT FURNACE

Typical Building Information

Category	Construction	Use	Occ.	Day
	21 BRICK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	1200	1200	1200	900	900	900	1200
Stop Time	1200	2000	2000	2100	2100	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor	-	0.8
CFM - HTG		4000
CFM - CLG		4000
% OA		12.00%
% Area		100.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
HOAOH	214.18	214.18
НОАОНС	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

10-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10732

System Name:

SINGLE ZONE AHU

System Number:

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	13,981.3	0.0	
Optimum ST/SP	0.0	425.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	54.9	
Sub Total	0.0	14,407.2	54.9	
Economizer	0.0	305.7	0.0	
Ventilation/Recirculation	0.0	63.6	8.6	
DDC Control	0.0	2,981.7	18.7	, ,
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		<u>, </u>		
Run Time, and Safety Alarms				3
TOTAL	0.0	17,758.1	82.1	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10732

EMC NO.: 1406-006

10-Apr-95 DATE:

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

*PROPANE IN-DUCT FURNACE

Building Sq.Ft.:

4,000

System Type

System Name:

11 **CONDENSING UNIT**

System Number:

ACCU-1

Typical Building Information

Typical Ballanig intermation						
Category	Construction	Use	Occ.	Day		
21	BRICK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	1200	1200	1200	900	900	900	1200
Stop Time	1200	2000	2000	2100	2100	1700	1700

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	. 0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		13.36
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC		1.84E-03
COAUHC	7.04E-04	7.04E-04
HOAOH	214.18	214.18
HOAOHC	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	0.00
OAR	7.40	7.40
OPT	188.00	188.00

E M C ENGINEERS, INC. PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

10-Apr-95 PAGE 2 OF 2

Bldg Number:

10732

System Type System Name:

11 **CONDENSING UNIT**

System Number:

ACCU-1

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	945.2	0.0	
Optimum ST/SP	0.0	86.3	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.9	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.9	1,031.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.9	1,031.5	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10732

EMC NO.: 1406-006

10-Apr-95 DATE:

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.: System Type

4,000

11

System Name: System Number:

ACCU-2

CONDENSING UNIT

*PROPANE IN-DUCT FURNACE

Typical Building Information

ſ	Category	Construction	Use	Occ.	Day
Ì	21	BRICK	CLO SALES/RETAIL/COM	1000-2000	SUN-SAT

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	1200	1200	1200	900	900	900	1200
Stop Time	1200	2000	2000	2100	2100	1700	1700

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0.5
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		13.36
MBTU CAPC.		0
kW/Ton		0
MOSON		5
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,300	3,360
Heating HRSON	2,080	5,376
C/H HRSON	3,389	8,760
Cooling HRSAV	2,060	
Heating HRSAV	3,296	
C/H HRSAV	5,371	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.84E-03	1.84E-03
COAUHC	7.04E-04	7.04E-04
НОАОН	214.18	214.18
HOAOHC	131.44	131.44
COAOC	5.98E-03	5.98E-03
COAOHC	2.29E-03	2.29E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	5.88E-05	5.88E-05
ECHC	2.26E-05	2.26E-05
NSUCC	1.54E-04	1.54E-04
NSUCHC	9.45E-05	9.45E-05
DDCCHC	8.44E-05	8.44E-05
DDCCC	2.20E-04	2.20E-04
DSC	4.66E+03	4.66E+03
NSC	1.37E+04	1.37E+04
FV	93	93
CHWR	9.57	0.00
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

10-Apr-95 PAGE 2 OF 2

Bldg Number:

10732

System Type

11

System Name:

CONDENSING UNIT

System Number:

ACCU-2

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	945.2	0.0	
Optimum ST/SP	0.0	86.3	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.9	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.9	1,031.5	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.9	1,031.5	0.0	3

ENERGY CALCULATIONS

BUILDING 10745

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10745

EMC NO.: 1406-006 DATE:

05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

23,500

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HX-1

Typical Building Information

		.,			
Category	Const	ruction	Use	Occ.	Day
	22 BF	RICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	600	1900	1900	1900	1900	1900	600

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	26.00%
TON CAPC.	0
MBTU CAPC.	2.155
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 78.00	% 78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,720	3,360
Heating HRSON	2,752	5,376
C/H HRSON	4,484	8,760
Cooling HRSAV	1,640	
Heating HRSAV	2,624	
C/H HRSAV	4,276	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	91.77	91.77
HOAOHC	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.55E+04	2.55E+04
NSC	9.79E+04	9.79E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10745

System Name:

12 BASEBOARD RADIATION

System Number:

HX-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,013.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	·
Night Setback	0.0	0.0	598.1	
Sub Total	0.0	4,300.8	598.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	155.7	
HW OA Reset	0.0	0.0	15.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,300.8	769.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

00 500

10745

TH

700

1900

700

1900

DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

EMC NO.: 1406-006

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S

0

0

700

1900

Building Sq.Ft.:

23,500

System Type

em Type

System Name:

Start Time

Stop Time

H&V UNIT WITHOUT RETURN FAN

BLDG:

System Number:

HV-1

Typical Building Information

Category	Construction	Use	Occ.	Day
22	BRICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

700

1900

Required Operation	S	М	Т	W

0

0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

700

1900

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	3445
CFM - CLG	0
% OA	25.30%
% Area	24.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	91.77	91.77
HOAOHC	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.55E+04	2.55E+04
NSC	9.79E+04	9.79E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10745

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HV-1

1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	7,815.4	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	552.1	
Sub Total	0.0	8,103.0	552.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	143.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,103.0	695.8	

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10745

05-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

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EMC NO.: 1406-006

Building Sq.Ft.:

23,500

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

HV-2 System Number:

Typical Building Information

typical ballaning illicities.							
Category		Construction	Use	Occ.	Day		
	22	BRICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI		

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	1.5
Load Factor	0.8
CFM - HTG	2400
CFM - CLG	0
% OA	100.00%
% Area	16.80%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	91.77	91.77
HOAOHC	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.55E+04	2.55E+04
NSC	9.79E+04	9.79E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10745

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HV-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,607.0	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	386.5	
Sub Total	0.0	6,850.0	386.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	100.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	6,850.0	487.1	3.1

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10745

DATE: 05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

23,500

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HV-3

Typical Building Information

Typical Dallering Wildermation							
Catego	Category Construction		Use	Occ.	Day		
	22	BRICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI		

20 32

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700		700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		2359
CFM - CLG		0
% OA		25.30%
% Area		16.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	91.77	91.77
HOAOHC	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.55E+04	2.55E+04
NSC	9.79E+04	9.79E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10745

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HV-3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,607.0	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	4
Night Setback	0.0	0.0	379.6	
Sub Total	0.0	6,850.0	379.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	98.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	6,850.0	478.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10745

05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

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EMC NO.: 1406-006

23,500

Building Sq.Ft.: System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HV-4

Typical Building Information

Typical Danaing information							
Category	Construction	Use	Occ.	Day			
2	2 BRICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	1.5
Load Factor	0.8
CFM - HTG	2359
CFM - CLG	0
% OA	25.30%
% Area	16.50%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP	69.20% 69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	91.77	91.77
НОАОНС	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC		0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.55E+04	2.55E+04
NSC	9.79E+04	9.79E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10745

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HV-4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,607.0	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	379.6	
Sub Total	0.0	6,850.0	379.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	98.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	6,850.0	478.4	3

ENERGY CALCULATIONS

BUILDING 10785

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

10785

28-Mar-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

3,024

System Type System Name:

2 **H&V UNIT**

System Number:

AHU1

Typical Building Information

. , , , , , , , , , , , , , , , , , , ,							
Category		Construction	Use	Occ.	Day		
	24	BRICK	CHAPEL ZONE	0800-1400	SUN		

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	Ť	W	TH	F	S
Start Time	800	0	0	0	0	0	0
Stop Time	1400	0	0	0	0	0	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	17.5
Load Factor	0.8
CFM - HTG	4100
CFM - CLG	0
% OA	48.78%
% Area	58.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 86.70%	86.70%

HOURS	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	160	3,360
Heating HRSON	256	5,376
C/H HRSON	417	8,760
Cooling HRSAV	3,200	
Heating HRSAV	5,120	
C/H HRSAV	8,343	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	372.76	372.76
HOAOHC	185.87	185.87
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	7.01E+03	7.01E+03
NSC	2.51E+05	2.51E+05
FV	147	147
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10785

System Type

2

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	100,445.3	0.0	
Optimum ST/SP	0.0	2,263.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	441.0	
Sub Total	0.0	102,708.8	441.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	9.4	
DDC Control	0.0	0.0	12.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	102,708.8	462.7	3 Table 1 Table 3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10785

DATE:

28-Mar-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

7,048

System Type

Stop Time

System Name:

H&V UNIT

1300

System Number:

AHU2

Typical Building Information

Typical Danaing internation								
Category	Category Construction		Use	Occ.	Day			
	25	BRICK	CHAPEL OFFICE ZONE	0600-1700	SUN-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	830	0	900	0	900	0	
Stop Time	1300	0	1200	0	1200	0	

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT					
Motor HP		11.65					
Load Factor		0.8					
CFM - HTG		2900					
CFM - CLG	CFM - CLG						
% OA		31.03%					
% Area		73.00%					
TON CAPC.		0					
MBTU CAPC.		0					
kW/Ton		0					
MOSON		12					
EFF		1					
LOOK-UP VALUE							
EFFHP	85.80%	85.80%					

HOURS	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	334	3,360
Heating HRSON	534	5,376
C/H HRSON	871	8,760
Cooling HRSAV	3,026	
Heating HRSAV	4,842	
C/H HRSAV	7,889	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	347.79	347.79
HOAOHC	173.42	173.42
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	1.26E+04	1.26E+04
NSC	3.30E+04	3.30E+04
FV	52	52
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10785

System Type

2

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	63,895.2	0.0	
Optimum ST/SP	0.0	1,522.6	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	169.6	
Sub Total	0.0	65,417.8	169.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	4.5	
DDC Control	0.0	0.0	64.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	65,417.8	238.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10785

EMC NO.: 1406-006

28-Mar-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.: System Type

40,519

System Name:

H&V UNIT

System Number:

AHU3

Typical Building Information

Category	Category Construction		Occ.	Day	
23	BRICK	CHAPEL/REL ED/CHILD C	0600-1800	MON-FRI	

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	e Lateina	INPUT
Motor HP		6.7
Load Factor		0.8
CFM - HTG		3500
CFM - CLG		0
% OA		19.29%
% Area		6.83%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT		
HOAUH	0.00	0.00		
HOAUHC	0.00	0.00		
COAUC	0.00E+00	0.00E+00		
COAUHC	0.00E+00	0.00E+00		
HOAOH	231.05	231.05		
HOAOHC	115.21	115.21		
COAOC		0.00E+00		
COAOHC	0.00E+00	0.00E+00		
DC DUTY	0.00	0.00		
DC DEMAN	0.17	0.17		
ECC	0.00E+00	0.00E+00		
ECHC	0.00E+00	0.00E+00		
NSUCC	0.00E+00	0.00E+00		
NSUCHC	0.00E+00	0.00E+00		
DDCCHC	0.00E+00	0.00E+00		
DDCCC	0.00E+00	0.00E+00		
DSC	9.94E+03	9.94E+03		
NSC	5.70E+03	5.70E+03		
FV	0	0		
CHWR	9.57	9.57		
OAR	7.40	7.40		
OPT	188.00	188.00		

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10785

System Type

2

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	25,026.6	0.0	*
Optimum ST/SP	0.0	920.7	0.0	
Duty Cycle	0.0	0.0	0.0	- Committee
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	15.8	
Sub Total	0.0	25,947.3	15.8	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	No. For all add
DDC Control	0.0	0.0	27.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	25,947.3	43.3	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10785

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

28-Mar-95

Building Sq.Ft.:

40,519

System Type System Name:

H&V UNIT

System Number:

AHU4

Typical Building Information

	Typical Building Information									
Γ	Category	Construction	Use	Occ.	Day					
r	2	BRICK	CHAPEL/REL ED/CHILD C	0600-1800	MON-FRI					

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		14.15
Load Factor		0.8
CFM - HTG		3500
CFM - CLG		0
% OA		12.00%
% Area		13.80%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT LOOK-UP INPUT HOAUH 0.00 0.00 HOAUHC 0.00 0.00E+00 COAUC 0.00E+00 0.00E+00 COAUHC 0.00E+00 0.00E+00 HOAOH 231.05 231.05 HOAOHC 115.21 115.21 COAOC 0.00E+00 0.00E+00 DC DUTY 0.00 0.00E+00 DC DEMAN 0.17 0.17 ECC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 NSUCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40 OPT <td< th=""><th></th><th></th><th></th></td<>			
HOAUHC 0.00 0.00E+00 COAUC 0.00E+00 0.00E+00 COAUHC 0.00E+00 0.00E+00 HOAOH 231.05 231.05 HOAOHC 115.21 115.21 COAOC 0.00E+00 0.00E+00 COAOHC 0.00E+00 0.00E+00 DC DUTY 0.00 0.00E DC DEMAN 0.17 0.17 ECC 0.00E+00 0.00E+00 DC DEMAN 0.17 0.17 ECC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00	CONSTANT	LOOK-UP	INPUT
COAUC 0.00E+00 0.00E+00 COAUHC 0.00E+00 0.00E+00 HOAOH 231.05 231.05 HOAOHC 115.21 115.21 COAOC 0.00E+00 0.00E+00 COAOHC 0.00E+00 0.00E+00 DC DUTY 0.00 0.00 DC DEMAN 0.17 0.17 ECC 0.00E+00 0.00E+00 DC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 NSUCH 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00	HOAUH	0.00	0.00
COAUHC 0.00E+00 0.00E+00 HOAOH 231.05 231.05 HOAOHC 115.21 115.21 COAOC 0.00E+00 0.00E+00 COAOHC 0.00E+00 0.00E+00 DC DUTY 0.00 0.00 DC DEMAN 0.17 0.17 ECC 0.00E+00 0.00E+00 ECHC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 NSUCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 TSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	HOAUHC	0.00	0.00
HOAOH 231.05 231.05 HOAOHC 115.21 115.21 COAOC 0.00E+00 0.00E+00 COAOHC 0.00E+00 0.00E+00 DC DUTY 0.00 0.00 DC DEMAN 0.17 0.17 ECC 0.00E+00 0.00E+00 ECHC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 NSUCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 TSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	COAUC	0.00E+00	0.00E+00
HOAOHC 115.21 115.21 COAOC 0.00E+00 0.00E+00 COAOHC 0.00E+00 0.00E+00 DC DUTY 0.00 0.00 DC DEMAN 0.17 0.17 ECC 0.00E+00 0.00E+00 ECHC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 NSUCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	COAUHC	0.00E+00	0.00E+00
COAOC 0.00E+00 0.00E+00 COAOHC 0.00E+00 0.00E+00 DC DUTY 0.00 0.00 DC DEMAN 0.17 0.17 ECC 0.00E+00 0.00E+00 ECHC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 NSUCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 TSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	HOAOH	231.05	231.05
COAOHC 0.00E+00 0.00E+00 DC DUTY 0.00 0.00 DC DEMAN 0.17 0.17 ECC 0.00E+00 0.00E+00 ECHC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 NSUCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	HOAOHC	115.21	115.21
DC DUTY 0.00 0.00 DC DEMAN 0.17 0.17 ECC 0.00E+00 0.00E+00 ECHC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 NSUCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	COAOC	0.00E+00	0.00E+00
DC DEMAN 0.17 0.17 ECC 0.00E+00 0.00E+00 ECHC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 NSUCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	COAOHC	0.00E+00	0.00E+00
ECC 0.00E+00 0.00E+00 ECHC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 NSUCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	DC DUTY	0.00	0.00
ECHC 0.00E+00 0.00E+00 NSUCC 0.00E+00 0.00E+00 NSUCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	DC DEMAN	0.17	0.17
NSUCC 0.00E+00 0.00E+00 NSUCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	ECC	0.00E+00	0.00E+00
NSUCHC 0.00E+00 0.00E+00 DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	ECHC	0.00E+00	0.00E+00
DDCCHC 0.00E+00 0.00E+00 DDCCC 0.00E+00 0.00E+00 DSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	NSUCC	0.00E+00	0.00E+00
DDCCC 0.00E+00 0.00E+00 DSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	NSUCHC	0.00E+00	0.00E+00
DSC 9.94E+03 9.94E+03 NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	DDCCHC	0.00E+00	0.00E+00
NSC 5.70E+03 5.70E+03 FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	DDCCC	0.00E+00	0.00E+00
FV 0 0 CHWR 9.57 9.57 OAR 7.40 7.40	DSC	9.94E+03	9.94E+03
CHWR 9.57 9.57 OAR 7.40 7.40	NSC	5.70E+03	5.70E+03
OAR 7.40 7.40	FV	0	0
	CHWR	9.57	9.57
OPT 188.00 188.00	OAR	7.40	7.40
	OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10785

System Type

2

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	50,267.3	0.0	
Optimum ST/SP	0.0	1,849.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	31.9	
Sub Total	0.0	52,116.7	31.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	55.6	3-11
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				·
Run Time, and Safety Alarms				3
TOTAL	0.0	52,116.7	87.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

40,519

10785

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

DATE:

Building Sq.Ft.:

System Type System Name:

H&V UNIT

System Number:

AHU5

Typical Building Information

Category	Construction	Use	Occ.	Day
2:	BRICK	CHAPEL/REL ED/CHILD C	0600-1800	MON-FRI

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		10
Load Factor		0.8
CFM - HTG		2800
CFM - CLG		0
% OA		25.00%
% Area		11.10%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	231.05	231.05
HOAOHC	115.21	115.21
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.94E+03	9.94E+03
NSC	5.70E+03	5.70E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

System Type

2

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	35,524.6	0.0	•
Optimum ST/SP	0.0	1,307.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	25.6	
Sub Total	0.0	36,831.6	25.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	44.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	36,831.6	70.3	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

10785

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

40,519

System Type

System Name:

H&V UNIT

System Number:

AHU6

Typical Building Information

Category		Construction	Use	Occ.	Day
	23	BRICK	CHAPEL/REL ED/CHILD C	0600-1800	MON-FRI

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		17.475
Load Factor		0.8
CFM - HTG		4850
CFM - CLG	0	
% OA		20.62%
% Area		19.22%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	86.70%	86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC		0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	231.05	231.05
HOAOHC	115.21	115.21
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.94E+03	9.94E+03
NSC	5.70E+03	5.70E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10785

System Type

2

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	61,434.9	0.0	
Optimum ST/SP	0.0	2,260.2	0.0	777.60
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	44.4	
Sub Total	0.0	63,695.1	44.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	77.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	63,695.1	121.7	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

40,519

10785

Building Sq.Ft.:

System Type

2

System Name:

H&V UNIT AHU7

System Number:

	Typical Building Information					
Category		Construction	Use	Occ.	Day	
	23	BRICK	CHAPEL/REL ED/CHILD C	0600-1800	MON-FRI	

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	. 0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	6.3
Load Factor	0.8
CFM - HTG	1975
CFM - CLG	0
% OA	30.38%
% Area	7.81%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 81.	.60% 81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

	-	
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	231.05	231.05
HOAOHC	115.21	115.21
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.94E+03	9.94E+03
NSC	5.70E+03	5.70E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

28-Mar-95

DATE:

PAGE 1 OF 2

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10785

System Type

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	23,532.5	0.0	
Optimum ST/SP	0.0	865.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	18.0	
Sub Total	0.0	24,398.2	18.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	31.4	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	~
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	24,398.2	49.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

40,519

BLDG:

10785

Building Sq.Ft.: System Type

System Name:

H&V UNIT

System Number:

8UHA

	Typical Building Information									
Category		Construction	Use	Occ.	Day					
	23	BRICK	CHAPEL/REL ED/CHILD C	0600-1800	MON-FRI					

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP	10	
Load Factor		0.8
CFM - HTG		2850
CFM - CLG		0
% OA		21.05%
% Area		11.26%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	231.05	231.05
HOAOHC	115.21	115.21
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	9.94E+03	9.94E+03
NSC	5.70E+03	5.70E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

System Type

2

System Name:

H&V UNIT

System Number:

8UHA

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr	
Schedule ST/SP	0.0	35,524.6	0.0	······································	
Optimum ST/SP	0.0	1,307.0	0.0		
Duty Cycle	0.0	0.0	0.0		
Demand Limit	0.0	0.0	0.0		
Night Setback	0.0	0.0	26.0		
Sub Total	0.0	36,831.6	26.0		
Economizer	0.0	0.0	0.0		
Ventilation/Recirculation	0.0	0.0	0.0		
DDC Control	0.0	0.0	45.3		
HW OA Reset	0.0	0.0	0.0		
Chilled Water Reset	0.0	0.0	0.0		
Condenser Water Reset	0.0	0.0	0.0	-	
Chiller Demand Limit	0.0	0.0	0.0		
Remote Monitoring, Maintenance,					
Run Time, and Safety Alarms					3
TOTAL	0.0	36,831.6	71.3		3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

40,519

10785

28-Mar-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type

System Name:

H&V UNIT AHU9

System Number:

Typical Building Information

Typical Bullating Information									
Category	Construction	Use	Occ.	Day					
23	BRICK	CHAPEL/REL ED/CHILD C	0600-1800	MON-FRI					

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

BLDG:

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	10.0	INPUT
Motor HP		11.65
Load Factor		0.8
CFM - HTG		3475
CFM - CLG		0
% OA		25.90%
% Area	-3 4402	13.80%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	85.80%	85.80%

HOURS	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	231.05	231.05
HOAOHC	115.21	115.21
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.94E+03	9.94E+03
NSC	5.70E+03	5.70E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10785

System Type

2

System Name:

H&V UNIT

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	41,386.2	0.0	
Optimum ST/SP	0.0	1,522.6	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	31.9	
Sub Total	0.0	42,908.8	31.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	55.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	42,908.8	87.4	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

40,519

10785

BLDG:

Building Sq.Ft.:
System Type

40,010

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

AHU10

Typical Building Information

Typical building information							
Category	Construction	Use	Occ.	Day			
2	3 BRICK	CHAPEL/REL ED/CHILD C	0600-1800	MON-FRI			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	militaria de la composición dela composición de la composición de la composición de la composición dela composición dela composición dela composición de la composición de la composición de la composición de la composición de la composición dela composición de la composición dela composición dela composición dela composición dela composición dela composición dela composi	INPUT				
Motor HP	Motor HP					
Load Factor	0.8					
CFM - HTG		1800				
CFM - CLG		0				
% OA		100.00%				
% Area	% Area					
TON CAPC.		0				
MBTU CAPC.		0				
kW/Ton		0				
MOSON		12				
EFF		1				
LOOK-UP VALUE						
EFFHP	79.00%	79.00%				

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	231.05	231.05
НОАОНС	115.21	115.21
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.94E+03	9.94E+03
NSC	5.70E+03	5.70E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

DATE: 28-Mar-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10785

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	14,468.4	0.0	
Optimum ST/SP	0.0	532.3	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	16.4	
Sub Total	0.0	15,000.7	16.4	7.565
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	28.6	1 19
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	15,000.7	45.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10785

Building Sq.Ft.:
System Type

40,519

12

System Name:

BASEBOARD RADIATION

System Number:

HE1

Typical Building Information

	Typical building information							
İ	Category	Construction	Use	Occ.	Day			
ĺ	2	3 BRICK	CHAPEL/REL ED/CHILD C	0600-1800	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	830	600	600	600	600	600	0
Stop Time	1300	1800	1800	1800	1800	1800	0

Present Operations	S	М	T	W	Ŧ	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	err e err twe	INPUT
Motor HP		0.75
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		25.80%
TON CAPC.		0
MBTU CAPC.		2.001
kW/Ton	-	0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,534	3,360
Heating HRSON	2,454	5,376
C/H HRSON	3,999	8,760
Cooling HRSAV	1,826	
Heating HRSAV	2,922	
C/H HRSAV	4,761	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	231.05	231.05
HOAOHC	115.21	115.21
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	9.94E+03	9.94E+03
NSC	5.70E+03	5.70E+03
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

28-Mar-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

28-Mar-95 PAGE 2 OF 2

Bldg Number:

10785

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HE1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,010.8	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	59.5	
Sub Total	0.0	2,140.2	59.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	103.9	
HW OA Reset	0.0	0.0	14.8	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,140.2	178.2	3

ENERGY CALCULATIONS

BUILDING 10790

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10790

05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

21,820

System Type System Name:

12 **BASEBOARD RADIATION**

System Number:

HX-1

Typical Building Information

Typical Bullating Information							
Category		Construction	Use	Occ.	Day		
	22	BRICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI		

20

Enter Weeks of Summer: 32 **Enter Weeks of Winter:**

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	600	1900	1900	1900	1900	1900	600

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		26.00%
TON CAPC.		0
MBTU CAPC.		2.155
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
		and the same of th
Cooling HRSON	1,720	3,360
Heating HRSON	2,752	5,376
C/H HRSON	4,484	8,760
Cooling HRSAV	1,640	
Heating HRSAV	2,624	
C/H HRSAV	4,276	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН		91.77
НОАОНС	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.55E+04	2.55E+04
NSC	9.79E+04	9.79E+04
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10790

System Type

System Name:

BASEBOARD RADIATION

System Number:

HX-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	4,013.2	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	555.4	
Sub Total	0.0	4,300.8	555.4	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	144.5	
HW OA Reset	0.0	0.0	15.9	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	4,300.8	715.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

21,820

10790

Building Sq.Ft.:

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HV-1

Typical Building Information

	Typical Building Information						
į	Category	Construction	Use	Occ.	Day		
	22	BRICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI		

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		3445
CFM - CLG		0
% OA		25.30%
% Area		24.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	91.77	91.77
НОАОНС	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		0.00E+00
DDCCC		0.00E+00
DSC		2.55E+04
NSC	9.79E+04	9.79E+04
FV	0	0
CHWR		9.57
OAR		7.40
OPT	188.00	188.00

EMC NO.: 1406-006

DATE: 05-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10790

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HV-1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	7,815.4	0.0	
Optimum ST/SP	0.0	287.5	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	552.1	
Sub Total	0.0	8,103.0	552.1	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	143.7	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	8,103.0	695.8	3.

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10790

DATE:

05-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

21,820

Building Sq.Ft.: System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

HV-2 System Number:

Typical Building Information

typical Daniang morniane.						
Category	Construction	Use	Occ.	Day		
	22 BRICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	1.5
Load Factor	0.8
CFM - HTG	2400
CFM - CLG	0
% OA	100.00%
% Area	16.80%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 69	9.20% 69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	91.77	91.77
HOAOHC	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.55E+04	2.55E+04
NSC	9.79E+04	9.79E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10790

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HV-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,607.0	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	386.5	
Sub Total	0.0	6,850.0	386.5	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	100.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	6,850.0	487.1	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

10790

D

DATE: 05-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

21,820

System Type

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HV-3

Typical Building Information

	.,,							
Category	Construction	Use	Occ.	Day				
2	2 BRICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700		700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		2359
CFM - CLG		0
% OA		25.30%
% Area		16.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	91.77	91.77
HOAOHC	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.55E+04	2.55E+04
NSC	9.79E+04	9.79E+04
FV	. 0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

10790

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

HV-3

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,607.0	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	379.6	
Sub Total	0.0	6,850.0	379.6	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	98.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	6,850.0	478.4	**************** 3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

10790

DATE: 05-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

21,820

HV-4

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

Typical Building Information

., y p. io c								
Category Construction		Use	Occ.	Day				
<u> </u>	22	BRICK	CHILD SUPPORT CENTER	0700-1900	MON-FRI			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	М	T	W	TH	FF	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		1.5
Load Factor		0.8
CFM - HTG		2359
CFM - CLG		0
% OA		25.30%
% Area		16.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	69.20%	69.20%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	91.77	91.77
HOAOHC	56.32	56.32
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.55E+04	2.55E+04
NSC	9.79E+04	9.79E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 10790

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HV-4

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	6,607.0	0.0	
Optimum ST/SP	0.0	243.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	379.6	
Sub Total	0.0	6,850.0	379.6	A.W.
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	98.8	19000
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		The second secon		
Run Time, and Safety Alarms				3
TOTAL	0.0	6,850.0	478.4	3

ENERGY CALCULATIONS

BUILDING 11050

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG: 67,570

11050

Building Sq.Ft.:

System Type

System Name:

CONVERTER AND PUMPS

System Number: HX-1

Typical Building Information

Typical Dallang Information						
Category	Construction	Use	Occ.	Day		
26	BRICK	CLINIC W/O BEDS/SUPPL	0700-1900	MON-FRI		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		2.16
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.37E-03	1.37E-03
COAUHC	5.64E-04	5.64E-04
HOAOH	130.00	130.00
HOAOHC	64.82	64.82
COAOC	6.15E-03	6.15E-03
COAOHC	2.06E-03	2.06E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	2.13E-04	2.13E-04
NSUCHC	1.44E-04	1.44E-04
DDCCHC	8.68E-06	8.68E-06
DDCCC	2.60E-05	2.60E-05
DSC	5.04E+03	5.04E+03
NSC	4.90E+04	4.90E+04
FV	0	194
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC PAGE 1 OF 2

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

11050

System Type

System Name:

CONVERTER AND PUMPS

System Number:

HX-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	16.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	16.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

11050

05-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

67,570

System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

Typical Building Information

	Typical Daniang Internation								
ſ	Category	Construction Use		Occ.	Day				
ľ	26	BRICK	CLINIC W/O BEDS/SUPPL	0700-1900	MON-FRI				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT					
Motor HP	1						
Load Factor	Load Factor						
CFM - HTG		0					
CFM - CLG		0					
% OA		0.00%					
% Area		0.00%					
TON CAPC.		0					
MBTU CAPC.		0.9					
kW/Ton		0					
MOSON		12					
EFF		1					
LOOK-UP VALUE							
EFFHP	69.20%	69.20%					

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.37E-03	1.37E-03
COAUHC	5.64E-04	5.64E-04
HOAOH	130.00	130.00
HOAOHC	64.82	64.82
COAOC	6.15E-03	6.15E-03
COAOHC	2.06E-03	2.06E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	2.13E-04	2.13E-04
NSUCHC	1.44E-04	1.44E-04
DDCCHC	8.68E-06	8.68E-06
DDCCC	2.60E-05	2.60E-05
DSC	5.04E+03	5.04E+03
NSC	4.90E+04	4.90E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

11050

System Type

1

System Name:

HOT WATER BOILER AND PUMPS

System Number:

B-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	6.7	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	6.7	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

67,570

11050

04-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type

12

System Name:

BASEBOARD RADIATION

System Number:

HX-1A

Typical Building Information

Category	Category Construction		Use	Occ.	Day
	26		CLINIC W/O BEDS/SUPPL	0700-1900	MON-FRI

Enter Weeks of Summer:

Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	0.75
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	18.70%
TON CAPC.	0
MBTU CAPC.	0.4393
kW/Ton	0
MOSON	7
EFF	1
LOOK-UP VALUE	
EFFHP 65.00%	65.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.37E-03	1.37E-03
COAUHC	5.64E-04	5.64E-04
НОАОН	130.00	130.00
HOAOHC	64.82	64.82
COAOC	6.15E-03	6.15E-03
COAOHC	2.06E-03	2.06E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	2.13E-04	2.13E-04
NSUCHO	1.44E-04	1.44E-04
DDCCHC	8.68E-06	8.68E-06
DDCCC	2.60E-05	2.60E-05
DSC	5.04E+03	5.04E+03
NSC	4.90E+04	4.90E+04
FV	194	194
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

11050

System Type

System Name:

BASEBOARD RADIATION

System Number:

HX-1A

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	2,158.3	0.0	
Optimum ST/SP	0.0	129.4	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	•
Night Setback	0.0	0.0	619.0	
Sub Total	0.0	2,287.7	619.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	63.6	
HW OA Reset	0.0	0.0	3.3	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	2,287.7	685.9	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

67,570

11050

10-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

DATE:

Building Sq.Ft.:

System Type

System Name:

VAV AHU AHU-1

System Number:

	Typical Building Information								
1	Category	Construction	Use	Occ.	Day				
	2	BRICK	CLINIC W/O BEDS/SUPPL	0700-1900	MON-FRI				

20 32

Enter Weeks of Summer: Enter Weeks of Winter:

Required Operation	S	M	Т	W	TH	F	S
Start Time		0 700	700	700	700	700	0
Stop Time		0 1900	1900	1900	1900	1900	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	15
Load Factor	0.8
CFM - HTG	7645
CFM - CLG	10130
% OA	46.00%
% Area	9.00%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 86	6.70% 86.70%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	İ
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.37E-03	1.37E-03
COAUHC	5.64E-04	5.64E-04
HOAOH	130.00	130.00
HOAOHC	64.82	64.82
COAOC	6.15E-03	6.15E-03
COAOHC	2.06E-03	2.06E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	2.13E-04	2.13E-04
NSUCHC	1.44E-04	1.44E-04
DDCCHC	8.68E-06	8.68E-06
DDCCC	2.60E-05	2.60E-05
DSC	5.04E+03	5.04E+03
NSC	4.90E+04	4.90E+04
FV	194	194
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

10-Apr-95 PAGE 2 OF 2

Bldg Number:

11050

System Type

7

System Name:

VAV AHU

System Number:

AHU-1

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	66,161.8	0.0	
Optimum ST/SP	0.0	1,940.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	297.9	
Sub Total	0.0	68,101.9	297.9	
	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	494.0	109.4	
DDC Control	0.0	959.8	30.6	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		· ·		
Run Time, and Safety Alarms				6
TOTAL	0.0	69,555.7	438.0	6

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

9,278

11050

Building Sq.Ft.: System Type

System Name:

VAV AHU

System Number:

AHU-2

Typical Building Information

Typical Ballating Information								
Category	Category Cons		Use	Occ.	Day			
	27	BRICK	CLINIC W/O BEDS/SUPPL	0000-2400	SUN-SAT			

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		4
Load Factor		0.8
CFM - HTG		2470
CFM - CLG		3190
% OA		26.00%
% Area		31.50%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
НОАОНС	0.00	0.00
COAOC		0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC		0.00E+00
DDCCHC		2.24E-04
DDCCC		6.71E-04
DSC	6.29E+04	6.29E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR		9.57
OAR		7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

10-Арг-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

10-Apr-95 PAGE 2 OF 2

Bldg Number:

System Type

System Name:

VAV AHU

System Number:

AHU-2

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	18,743.3	183.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,		77.700000		
Run Time, and Safety Alarms				6
TOTAL	0.0	18,743.3	183.8	6

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

11050

Building Sq.Ft.: 9,278

System Type

System Name: System Number: 4 SINGLE ZONE AHU

AHU-3

Typical Building Information

Typical building information						
Category Construction		Use	Occ.	Day		
	27	BRICK	CLINIC W/O BEDS/SUPPL	0000-2400	SUN-SAT	

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	М	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		2100
CFM - CLG		2100
% OA		100.00%
% Area		30.30%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	(4) A. A. A. M. M. M. G. CO. (2004)
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC		0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	2.24E-04	2.24E-04
DDCCC	6.71E-04	6.71E-04
DSC	6.29E+04	6.29E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

DATE: 05-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

11050

Bldg Number: System Type

System Name:

SINGLE ZONE AHU

System Number:

AHU-3

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	12,338.9	176.8	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	12,338.9	176.8	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

11050

DATE: 10-Apr-95 PREPARED BY: CSW/BMG

EMC NO.: 1406-006

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

9,278

System Type

VAV AHU

System Name: System Number:

AHU-4

Typical Building Information

Typical Baharing information								
Category		Construction	Use	Occ.	Day			
	27	BRICK	CLINIC W/O BEDS/SUPPL	0000-2400	SUN-SAT			

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	5
Load Factor	0.8
CFM - HTG	3475
CFM - CLG	4005
% OA	35.00%
% Area	23.18%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 81.6	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	0.00	0.00
НОАОНС	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC		0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	2.24E-04	2.24E-04
DDCCC	6.71E-04	6.71E-04
DSC	6.29E+04	6.29E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

10-Apr-95 PAGE 2 OF 2

Bldg Number:

11050

System Type

7

System Name:

VAV AHU

System Number:

AHU-4

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	23,532.0	135.2	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				6
TOTAL	0.0	23,532.0	135.2	6

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

67,570

11050

Building Sq.Ft.:

System Type

System Name:

VAV AHU

System Number:

AHU-5

Typical Building Information

Typical Building information								
Category	Construction	Use	Occ.	Day				
26	BRICK	CLINIC W/O BEDS/SUPPL	0700-1900	MON-FRI				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	5
Load Factor	0.8
CFM - HTG	3720
CFM - CLG	9915
% OA	25.00%
% Area	4.39%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.37E-03	1.37E-03
COAUHC	5.64E-04	5.64E-04
НОАОН	130.00	130.00
HOAOHC	64.82	64.82
COAOC	6.15E-03	6.15E-03
COAOHC	2.06E-03	2.06E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	2.13E-04	2.13E-04
NSUCHC	1.44E-04	1.44E-04
DDCCHC		8.68E-06
DDCCC	2.60E-05	2.60E-05
DSC	5.04E+03	5.04E+03
NSC	4.90E+04	4.90E+04
FV	194	194
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

10-Apr-95

DATE:

PAGE 1 OF 2

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

10-Apr-95 PAGE 2 OF 2

Bldg Number:

11050

System Type

7

System Name:

VAV AHU

System Number:

AHU-5

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	25,819.5	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	7.3	0.0	0.0	
Night Setback	0.0	0.0	145.3	
Sub Total	7.3	26,506.6	145.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	262.8	28.9	, , , , , , , , , , , , , , , , , , , ,
DDC Control	0.0	939.4	14.9	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				6
TOTAL	7.3	27,708.8	189.2	6

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

67,570

11050

DATE: 10-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type

VAV AHU

System Name: System Number:

AHU-6

Typical Building Information

Typical Danaing Internation									
Category Construction		Use	Occ.	Day					
	26	BRICK	CLINIC W/O BEDS/SUPPL	0700-1900	MON-FRI				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	_	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		11035
CFM - CLG		13685
% OA		25.00%
% Area		13.03%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.37E-03	1.37E-03
COAUHC	5.64E-04	5.64E-04
HOAOH	130.00	130.00
HOAOHC	64.82	64.82
COAOC	6.15E-03	6.15E-03
COAOHC	2.06E-03	2.06E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	2.13E-04	2.13E-04
NSUCHC	1.44E-04	1.44E-04
DDCCHC	8.68E-06	8.68E-06
DDCCC	2.60E-05	2.60E-05
DSC	5.04E+03	5.04E+03
NSC	4.90E+04	4.90E+04
FV	194	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

10-Арг-95 PAGE 2 OF 2

Bldg Number:

11050

System Type

System Name:

VAV AHU

System Number:

AHU-6

HEATING AND COOLING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	28,535.4	0.0	
Optimum ST/SP	0.0	687.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	7.3	0.0	0.0	•
Night Setback	0.0	0.0	431.3	
Sub Total	7.3	29,222.6	431.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	362.7	0.0	
DDC Control	0.0	1,296.6	44.3	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				6
TOTAL	7.3	30,881.9	475.7	6

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

11050

04-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

Typical Building Information

Typical Talliang										
Category	Category Construction		Use	Occ.	Day					
	26	BRICK	CLINIC W/O BEDS/SUPPL	0700-1900	MON-FRI					

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT		
Motor HP	Motor HP			
Load Factor		0.8		
CFM - HTG		5000		
CFM - CLG		0		
% OA		25.00%		
% Area		5.90%		
TON CAPC.		0		
MBTU CAPC.		0		
kW/Ton		0		
MOSON		12		
EFF		1		
LOOK-UP VALUE				
EFFHP	79.00%	79.00%		

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR	
Cooling HRSON	1,400	3,360	
Heating HRSON	2,240	5,376	
C/H HRSON	3,650	8,760	
Cooling HRSAV	1,960		
Heating HRSAV	3,136		
C/H HRSAV	5,110		

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.37E-03	1.37E-03
COAUHC	5.64E-04	5.64E-04
HOAOH	130.00	130.00
HOAOHC	64.82	64.82
COAOC	6.15E-03	6.15E-03
COAOHC	2.06E-03	2.06E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	2.13E-04	2.13E-04
NSUCHC	1.44E-04	1.44E-04
DDCCHC	8.68E-06	8.68E-06
DDCCC	2.60E-05	2.60E-05
DSC	5.04E+03	5.04E+03
NSC	4.90E+04	4.90E+04
FV	194	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

11050

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

HV-1

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	15,433.0	0.0	
Optimum ST/SP	0.0	567.8	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	195.3	
Sub Total	0.0	16,000.8	195.3	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	20.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	16,000.8	215.4	3 1

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6
CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

Building Sq.Ft.:
System Type

67,570

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

HV-2

11050

Typical Building Information

Typical building information							
Category		Construction	Use	Occ.	Day		
	26	BRICK	CLINIC W/O BEDS/SUPPL	0700-1900	MON-FRI		

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	М	T	W	TH	F	S
Start Time	0	700	700	700	700	700	0
Stop Time	0	1900	1900	1900	1900	1900	0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	7.5
Load Factor	0.8
CFM - HTG	9000
CFM - CLG	0
% OA	25.00%
% Area	10.60%
TON CAPC.	0
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 83.10%	6 83.10%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	3,360
Heating HRSON	2,240	5,376
C/H HRSON	3,650	8,760
Cooling HRSAV	1,960	
Heating HRSAV	3,136	
C/H HRSAV	5,110	

		,
CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.37E-03	1.37E-03
COAUHC	5.64E-04	5.64E-04
HOAOH	130.00	130.00
HOAOHC	64.82	64.82
COAOC	6.15E-03	6.15E-03
COAOHC	2.06E-03	2.06E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	2.13E-04	2.13E-04
NSUCHC	1.44E-04	1.44E-04
DDCCHC	8.68E-06	8.68E-06
DDCCC	2.60E-05	2.60E-05
DSC	5.04E+03	5.04E+03
NSC	4.90E+04	4.90E+04
FV	194	194
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

04-Арг-95

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

04-Apr-95 PAGE 2 OF 2

Bldg Number:

11050

System Type

.

System Name: System Number:

H&V UNIT WITHOUT RETURN FAN HV-2

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	27,509.1	0.0	
Optimum ST/SP	0.0	1,012.1	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	350.9	
Sub Total	0.0	28,521.2	350.9	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	70.0	
DDC Control	0.0	0.0	36.1	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	28,521.2	457.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

BLDG: 11050 LOCATION: FT. DRUM

Building Sq.Ft.:

67,570 8

System Type

System Name: System Number: **CHILLER AND PUMPS**

CHR-1A,B,C

Typical Building Information

. , , , , , , , , , , , , , , , , , , ,							
Category	Construction	Use	Occ.	Day			
26	BRICK	CLINIC W/O BEDS/SUPPL	0700-1900	MON-FRI			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	0	. 0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	INPUT
Motor HP	2
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	54.4
MBTU CAPC.	0
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH		0.00
HOAUHC	0.00	0.00
COAUC	1.37E-03	1.37E-03
COAUHC	5.64E-04	5.64E-04
HOAOH	130.00	130.00
HOAOHC	64.82	64.82
COAOC	6.15E-03	6.15E-03
COAOHC	2.06E-03	2.06E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	2.13E-04	2.13E-04
NSUCHC		1.44E-04
DDCCHC	·	8.68E-06
DDCCC	2.60E-05	2.60E-05
DSC	5.04E+03	5.04E+03
NSC	4.90E+04	4.90E+04
FV	0	0
CHWR	9.57	9.57
OAR		7.40
OPT	188.00	0.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

05-Apr-95

DATE:

PAGE 1 OF 2

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

Bldg Number:

System Type

System Name:

CHILLER AND PUMPS

System Number:

CHR-1A,B,C

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	3.1	0.0	0.0	,
Night Setback	0.0	0.0	0.0	
Sub Total	3.1	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	520.6	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	3.1	520.6	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

11050

BLDG:

Building Sq.Ft.: System Type

9,278

11

System Name:

CONDENSING UNIT

System Number:

ACCU1A-3B

Typical Building Information

Typical Zaliang Internation							
Category		Construction	Use	Occ.	Day		
	27	BRICK	CLINIC W/O BEDS/SUPPL	0000-2400	SUN-SAT		

Enter Weeks of Summer:

32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	eta Pala		INPUT
	or HP		4
Load	Factor		0.8
CFM -	HTG		0
CFM -	CLG		0
	% OA		0.00%
%	Area		0.00%
TON C	APC.		42.8
MBTU (CAPC.		0
k)	N/Ton		0
Me	OSON		5
	EFF		1
LOOK-UP VALU	E		
E	FFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	00 T0 T0 S S S S S S S S S S S S S S S S
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOKILD	INPUT
		0.00
HOAUH		
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	0.00	0.00
HOAOHC	0.00	0.00
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	2.24E-04	2.24E-04
DDCCC	6.71E-04	6.71E-04
DSC	6.29E+04	6.29E+04
NSC	0.00E+00	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	0.00	0.00

EMC NO.: 1406-006

PAGE 1 OF 2

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

05-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

05-Apr-95 PAGE 2 OF 2

11050

Bldg Number: System Type

System Name:

CONDENSING UNIT

System Number:

ACCU1A-3B

COOLING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	6.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	6.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	409.6	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,	•			
Run Time, and Safety Alarms				3
TOTAL	6.0	409.6	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

B-1

LOCATION: FT. DRUM

BLDG:

11050

DATE: 19-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

67,570

System Type

13

System Name:

STEAM HUMIDIFICATION

System Number:

Typical Building Information

. , p						
Category Construction		Use	Occ.	Day		
	26	BRICK	CLINIC W/O BEDS/SUPPL	0700-1900	MON-FRI	

Enter Weeks of Summer:

20

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	700	700	700	700	700	700	700
Stop Time	1700	1700	1700	1700	1700	1700	170

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.9
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	1,374	3,360
Heating HRSON	2,198	5,376
C/H HRSON	3,582	8,760
Cooling HRSAV	1,986	
Heating HRSAV	3,178	
C/H HRSAV	5,178	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	1.37E-03	1.37E-03
COAUHC	5.64E-04	5.64E-04
HOAOH	130.00	130.00
HOAOHC	64.82	64.82
COAOC	6.15E-03	6.15E-03
COAOHC	2.06E-03	2.06E-03
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC		2.13E-04
NSUCHC		1.44E-04
DDCCHC		8.68E-06
DDCCC	2.60E-05	2.60E-05
DSC	5.04E+03	5.04E+03
NSC	4.90E+04	4.90E+04
FV	194	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

19-Apr-95 PAGE 2 OF 2

Bldg Number:

11050

System Type

System Name:

STEAM HUMIDIFICATION

System Number:

B-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	6.7	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				0
TOTAL	0.0	0.0	6.7	3

ENERGY CALCULATIONS

BUILDING 11142

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

11142

Building Sq.Ft.:

1,465

10

System Type System Name:

HOT WATER BOILER AND PUMPS

System Number:

B1

Typical Building Information

	Typical Banding information								
ĺ	Category		nstruction	Use	Occ.	Day			
Ī		2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI			

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.455
kW/Ton		0
MOSON		0
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS	REQUIRED	
CALCULATIONS	HR/YR	HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT	
HOAUH	0.00	0.00	
HOAUHC	0.00	0.00	
COAUC	0.00E+00	0.00E+00	
COAUHC	0.00E+00	0.00E+00	
HOAOH	198.24	198.24	
HOAOHC	121.66	121.66	
COAOC	0.00E+00	0.00E+00	
COAOHC	0.00E+00	0.00E+00	
DC DUTY	0.00	0.00	
DC DEMAN	0.17	0.17	
ECC	0.00E+00	0.00E+00	
ECHC	0.00E+00	0.00E+00	
NSUCC	0.00E+00	0.00E+00	
NSUCHO	0.00E+00	0.00E+00	
DDCCHC	0.00E+00	0.00E+00	
DDCCC	0.00E+00	0.00E+00	
DSC	2.04E+03	2.04E+03	
NSC	5.85E+04	5.85E+04	
FV	0	0	
CHWR	9.57	9.57	
OAR	7.40	7.40	
OPT	188.00	188.00	

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

17-Apr-95

DATE:

PAGE 1 OF 2

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

17-Apr-95

PAGE 2 OF 2

Bldg Number:

11142

System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	<u> </u>
Ventilation/Recirculation	0.0	0.0	0.0	- 11
DDC Control	0.0	0.0	0.0	******
HW OA Reset	0.0	0.0	3.4	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,	A STATE OF THE STA			
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	3.4	3

ENERGY CALCULATIONS

BUILDING 11144

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

4,200

11144

Building Sq.Ft.:

10

System Type System Name:

HOT WATER BOILER AND PUMPS

System Number:

В1

Typical Building Information

Typical Ballang Information									
Category	Construction		Use	Occ.	Day				
	2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI				

Enter Weeks of Summer:

20

Enter Weeks of Winter:

32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

BLDG:

Present Operations	S	М	Ť	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS	11 10 11 1	INPUT
Motor HP		0
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0.269
kW/Ton		0
MOSON		0
EFF		1
LOOK-UP VALUE		
EFFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
		0.00
HOAUH	0.00	
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAN	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	5.85E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

EMC NO.: 1406-006

PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

DATE:

PAGE 1 OF 2

17-Apr-95

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

17-Apr-95 PAGE 2 OF 2

Bldg Number:

11144

System Type

System Name:

HOT WATER BOILER AND PUMPS

System Number:

B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	2.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	2.0	3

ENERGY CALCULATIONS

BUILDING 21517

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

21510/21516/21517

EMC NO.: 1406-006 DATE: 07-Apr-95

PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

19,247

System Type

9

System Name:

CONVERTER AND PUMPS

System Number:

HX-1

Typical Building Information

Category	Construction	Use	Occ.	Day	
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI	

Enter Weeks of Summer: Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

Present Operations	S	M	T	W	TH	F	S
Start Time	0	0	0	0	0	0	0
Stop Time	2400	2400	2400	2400	2400	2400	2400

INPUTS		INPUT
Motor HP		2
Load Factor		0.8
CFM - HTG		0
CFM - CLG		0
% OA		0.00%
% Area		0.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		12
EFF		1
LOOK-UP VALUE		
EFFHP	78.00%	78.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	3,360	3,360
Heating HRSON	5,376	5,376
C/H HRSON	8,760	8,760
Cooling HRSAV	0	
Heating HRSAV	. 0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	5.85E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

07-Apr-95 PAGE 2 OF 2

Bldg Number:

System Number:

21510/21516/21517

System Type System Name:

9 **CONVERTER AND PUMPS**

HX-1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	0.0	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

21510

EMC NO.: 1406-006

DATE:

07-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

19,247

System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

B1

Typical Building Information

Typical Bullang Information							
Category Construction		Use	Occ.	Day			
	2 BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI			

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS			INPUT
	or HP		0
Load	Factor		0.8
CFM -	HTG		0
CFM -	CLG		0
	% OA		0.00%
%	Area		0.00%
TON C	APC.		0
MBTU (CAPC.		6.695
k\	W/Ton		0
M	OSON		12
	EFF		1
LOOK-UP VALUI			
E	FFHP	0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC		0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC		0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	5.85E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

07-Apr-95 PAGE 2 OF 2

Bldg Number:

21510

System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

B1

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	49.5	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	49.5	3

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

21510

EMC NO.: 1406-006

07-Apr-95 DATE: PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

19,247

System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

B2

Typical Building Information

.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						
Category	Construction	Use	Occ.	Day		
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI		

Enter Weeks of Summer:

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH_	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS	INPUT
Motor HP	0
Load Factor	0.8
CFM - HTG	0
CFM - CLG	0
% OA	0.00%
% Area	0.00%
TON CAPC.	0
MBTU CAPC.	6.695
kW/Ton	0
MOSON	12
EFF	1
LOOK-UP VALUE	
EFFHP 0.00%	0.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC		0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	5.85E+04
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	188.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

07-Apr-95 PAGE 2 OF 2

Bldg Number:

21510

System Type

10

System Name:

HOT WATER BOILER AND PUMPS

System Number:

B2

HEATING ONLY SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	· ·
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	0.0	
HW OA Reset	0.0	0.0	49.5	_
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3_
TOTAL	0.0	0.0	49.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

21510

EMC NO.: 1406-006

DATE: 07-Apr-95 PREPARED BY: CSW/BMG

CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

19,247

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU01

Typical Building Information

	. , , ,	and and		
Category	Construction	Use	Occ.	Day
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI

Enter Weeks of Summer:

Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		11250
CFM - CLG		0
% OA		100.00%
% Area		9.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	. 0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND		0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

07-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 21510

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0,0	0.0	0.0	
DDC Control	0.0	0.0	3.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	3.5	3.0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

21510

EMC NO.: 1406-006

DATE: 07-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU02

Typical Building Information

Typiou. Dunanig international								
Category	Construction	Use	Occ.	Day				
	2 BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI				

Enter Weeks of Summer:

20 32

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		5625
CFM - CLG		0
% OA		100.00%
% Area		9.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

07-Apr-95

PAGE 2 OF 2

Bldg Number: System Type 21510

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	A. A. A. A. A. A. A. A. A. A. A. A. A. A
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	3.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

19,247

21510

EMC NO.: 1406-006 DATE: 07-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU03

Typical Building Information

	. , , , , , , , , , , , , , , , , , , ,							
Ca	tegory	Construction	Use	Occ.	Day			
	2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI			

0 2

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

BLDG:

Present Operations	S	M	T	W	TH_	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0
Otop Tillo							

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		11250
CFM - CLG		0
% OA		100.00%
% Area		9.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

07-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 21510

System Type
System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	,
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	3.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

21510

DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

EMC NO.: 1406-006

PAGE 1 OF 2

Building Sq.Ft.:

19,247

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU04

Typical Building Information

	. , p				
Category	Construction	Use	Occ.	Day	
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI	

Enter Weeks of Summer:

Enter Weeks of Winter:

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

4.00	INPUTS		INPUT
	Motor HP		5
	Load Factor		0.8
	CFM - HTG		11250
	CFM - CLG		0
	% OA		100.00%
	% Area		9.00%
	TON CAPC.		0
	MBTU CAPC.		0
	kW/Ton		0
	MOSON		7
	EFF		1
LOOK	(-UP VALUE		
	EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	•

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	198.24	198.24
НОАОНС	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Condenser Water Reset

Remote Monitoring, Maintenance,

TOTAL

Run Time, and Safety Alarms

Chiller Demand Limit

Date:

0.0

0.0

3.5

07-Apr-95 PAGE 2 OF 2

3

3

Bldg Number:

21510

System Type

System Name: System Number: **H&V UNIT WITHOUT RETURN FAN** MAU04

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	

0.0

0.0

0.0

0.0

0.0

0.0

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

BLDG:

21510

EMC NO.: 1406-006

07-Apr-95 DATE:

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type

19,247

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU5

Typical Building Information

.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
Category	Construction	Use	Occ.	Day			
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI			

Enter Weeks of Summer:	20
Enter Weeks of Winter:	32

Required Operation	S	М	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0
Stop Time			L				

Present Operations	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT				
Motor HP		3				
Load Factor		0.8				
CFM - HTG						
CFM - CLG		0				
% OA		100.00%				
% Area		9.00%				
TON CAPC.		0				
MBTU CAPC.		0				
kW/Ton		0				
MOSON		7				
EFF		1				
LOOK-UP VALUE						
EFFHP	79.00%	79.00%				

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC		0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

07-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 21510

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	3.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

_ _ _

21510

EMC NO.: 1406-006 DATE:

DATE: 07-Apr-95
PREPARED BY: CSW/BMG
CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

19,247

System Type

1

System Type
System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU06

Typical Building Information

. yp.ou. Juning							
Category Construction		Use	Occ.	Day			
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI			

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		11250
CFM - CLG		0
% OA		100.00%
% Area		9.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP 8	31.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН		198.24
HOAOHC		121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

Date:

07-Apr-95 PAGE 2 OF 2

Bldg Number:

21510

System Type

H&V UNIT WITHOUT RETURN FAN

System Name: System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	3.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

19,247

21510

EMC NO.: 1406-006 DATE: 07-Apr-95

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

System Type

.....

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU07

Typical Building Information

rypical building information						
Category	Construction	Use	Occ.	Day	1	
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI	ļ	

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

BLDG:

Present Operations	S	М	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HF)	3
Load Facto	or	0.8
CFM - HTC	3	5625
CFM - CLC	3	0
% OA	4	100.00%
% Area	a	9.00%
TON CAPC		0
MBTU CAPO	5.	0
kW/To	on	0
MOSO	N	7
EFF	F	1
LOOK-UP VALUE		
EFFHF	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	. 0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

07-Apr-95 PAGE 2 OF 2

Bldg Number:

21510

1

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	3.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

40.047

21510

BLDG:

EMC NO.: 1406-006 DATE: 07-Apr-95

0

0

PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

600

1800

Building Sq.Ft.:

19,247

System Type

······

System Name:

Start Time

Stop Time

H&V UNIT WITHOUT RETURN FAN

System Number:

80UAM

Typical Building Information

Typical Ballating Information							
Category	Construction	Use	Occ. Day				
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI			

Enter Weeks of Summer: Enter Weeks of Winter:

20 32

600

1800

Elice: Creene el como	ı		"		
Required Operation	S	M	T	W	TH
(sedan ca abaidan)					

0

0

Present Operations	S	M	Т	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0
Stop Time							

600

1800

600

1800

600

INPUTS		INPUT
Motor HP		3
Load Factor		0.8
CFM - HTG		5625
CFM - CLG		0
% OA		100.00%
% Area		9.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	79.00%	79.00%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	0.00E+00
FV	·	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

07-Apr-95 PAGE 2 OF 2

Bldg Number:

21510

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

80UAM

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	3.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

21510

DATE: 07-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

EMC NO.: 1406-006

Building Sq.Ft.:

System Type

System Name:

H&V UNIT WITHOUT RETURN FAN

MAU09 System Number:

Typical Building Information

Category	Construction	Use	Occ.	Day
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI

Enter Weeks of Summer:

Enter Weeks of Winter:

20 32

Required Operation	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

BLDG:

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		11250
CFM - CLG		0
% OA		100.00%
% Area		9.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
HOAOH	198.24	198.24
НОАОНС	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHC	0.00E+00	0.00E.+00
DDCCHC	0.00E+00	0.00E+00
DDCCC	0.00E+00	0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

07-Apr-95 PAGE 2 OF 2

Bldg Number: System Type 21510

1

System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	•
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	3.5	3

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 **CLIENT PROJECT ENGINEER: STEVE ROWLEY**

LOCATION: FT. DRUM

BLDG:

21510

EMC NO.: 1406-006

DATE:

07-Apr-95 PREPARED BY: CSW/BMG CHECKED BY: KC/WLC

PAGE 1 OF 2

Building Sq.Ft.:

19,247

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

MAU10

Typical Building Information

	. , p			
Category	Construction	Use	Occ.	Day
2	BRICK	MOTOR REPAIR SHOP	0600-1730	MON-FRI

Enter Weeks of Summer:

Enter Weeks of Winter:	32

Required Operation	S	M	T	W	TH	<u> </u>	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0

Present Operations	S	M	T	W	TH	F	S
Start Time	0	600	600	600	600	600	0
Stop Time	0	1800	1800	1800	1800	1800	0
Ctop Time							

INPUTS		INPUT
Motor HP		5
Load Factor		0.8
CFM - HTG		11250
CFM - CLG		0
% OA		100.00%
% Area		9.00%
TON CAPC.		0
MBTU CAPC.		0
kW/Ton		0
MOSON		7
EFF		1
LOOK-UP VALUE		
EFFHP	81.60%	81.60%

HOURS CALCULATIONS	REQUIRED HR/YR	PRESENT HR/YR
Cooling HRSON	1,400	1,200
Heating HRSON	2,240	1,920
C/H HRSON	3,650	3,129
Cooling HRSAV	0	
Heating HRSAV	0	
C/H HRSAV	0	

CONSTANT	LOOK-UP	INPUT
HOAUH	0.00	0.00
HOAUHC	0.00	0.00
COAUC	0.00E+00	0.00E+00
COAUHC	0.00E+00	0.00E+00
НОАОН	198.24	198.24
HOAOHC	121.66	121.66
COAOC	0.00E+00	0.00E+00
COAOHC	0.00E+00	0.00E+00
DC DUTY	0.00	0.00
DC DEMAND	0.17	0.17
ECC	0.00E+00	0.00E+00
ECHC	0.00E+00	0.00E+00
NSUCC	0.00E+00	0.00E+00
NSUCHO	0.00E+00	0.00E+00
DDCCHC	0.00E+00	0.00E+00
DDCCC		0.00E+00
DSC	2.04E+03	2.04E+03
NSC	5.85E+04	0.00E+00
FV	0	0
CHWR	9.57	9.57
OAR	7.40	7.40
OPT	188.00	0.00

PROJECT: UMCS FEASIBILITY STUDY

CLIENT CONTRACT NO.: DACA01-94-D-0033 D.O. 6 CLIENT PROJECT ENGINEER: STEVE ROWLEY

LOCATION: FT. DRUM

Date:

07-Apr-95 PAGE 2 OF 2

Bldg Number:

21510

System Type System Name:

H&V UNIT WITHOUT RETURN FAN

System Number:

HEATING AND VENTILATING SYSTEMS	kW/yr	kWh/yr	MBtu/yr	MH/yr
Schedule ST/SP	0.0	0.0	0.0	
Optimum ST/SP	0.0	0.0	0.0	
Duty Cycle	0.0	0.0	0.0	
Demand Limit	0.0	0.0	0.0	
Night Setback	0.0	0.0	0.0	
Sub Total	0.0	0.0	0.0	
Economizer	0.0	0.0	0.0	
Ventilation/Recirculation	0.0	0.0	0.0	
DDC Control	0.0	0.0	3.5	
HW OA Reset	0.0	0.0	0.0	
Chilled Water Reset	0.0	0.0	0.0	
Condenser Water Reset	0.0	0.0	0.0	
Chiller Demand Limit	0.0	0.0	0.0	
Remote Monitoring, Maintenance,				
Run Time, and Safety Alarms				3
TOTAL	0.0	0.0	3.5	11 (1 (1 (1 (1 (1 (1 (1 (1 (1 (1 (1 (1 (